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ABSTRACT

A study was conducted to answer two main questions: (1) What are the vocational needs of high school students? and (2) What are the life history correlates of such vocational needs? Over 1,750 high school students in grades 8 through 11 were administered a measure of vocational needs, the Minnesota Importance Questionnaire, and a questionnaire designed to elicit life history information, the Student Information Blank. The results of the study contain preliminary evidence that suggests the existence of similar average patterns of needs across grade, sex, and sex-by-grade groups. It was found that the most important vocational need for all groups was ability utilization. In addition, the findings contained preliminary evidence that background data are related to vocational needs. However, while there was evidence linking background data meaningfully to vocational needs, there was little evidence to support the generalizability of findings across groups. (The Student Information Blank, data collection exhibits, and summary statistical data are appended.) (LRA)

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FINAL REPORT

Project No. 2 P.F.-79

A CROSS-SECTIONAL STUDY OF THE ORIGINS AND DEVELOPMENT OF VOCATIONAL NEEDS OF HIGH SCHOOL STUDENTS

Conducted Using Funds Provided by the
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April, 1980

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A CROSS-SECTIONAL STUDY
OF THE ORIGINS AND DEVELOPMENT
OF VOCATIONAL NEEDS OF HIGH SCHOOL STUDENTS

CHAPTER I

INTRODUCTION

> If a man has a talent and cannot use it, he has failed. If he has a talent and uses only half of it, he has partly failed. If he has a talent and learns somehow to use the whole of it, he has gloriously succeeded, and won a satisfaction and a triumph few men ever know.

So wrote Thomas Clayton Wolfe.

Unfortunately, waste, misuse, and abuse of human talent is all too evident in our society; the national waste of human resources is appalling. There is no good way to measure the cost of frustration and unhappiness for the many individuals whose time and effort go into activities that bring them little satisfaction. Assigning a dollar value to the squandering of human talent is a futile task.

Origins of the Study

The present study was motivated by an underlying question: Can this waste of human talent somehow be reversed? Can the tragic drifting spirit caught by the words of T.S. Eliot in his book The Wasteland--"What shall I do? What shall we do tomorrow? What shall I ever do?"--be somehow exorcised? Perhaps if a supreme effort were made, we might be able to realize the talent of each man, woman, and child. Before this can come about, however, one needs to ask: What is talent? How can it best be developed? How can human beings make the best use of their talents?

What is Talent?

Efforts to define human talent have become technically difficult with the rapid accumulation of new knowledge about individual differences. Nevertheless, it is assumed that the essential worth of all individuals and their right to develop their potentiality to the fullest are valid concepts. However, there is still the fact of differences in actual ability as well as in potential or capacity for development. Differences in ability are easier to demonstrate. Differences in potential are more complex, and the experts themselves are not always in agreement about these differences.

Following Flanagan (1960), talent may be defined as an individual's unique potential for learning to perform various types of activities important in our culture. Present evidence (Flanagan, 1960) suggests that talent represents only potential ability to learn and must be developed, and that there are a variety of patterns and combinations of talent present in each individual.

Since talent represents each individual's potential for learning, the obvious question for vocational educators is how best to realize this potential.

Motivation: The Satisfaction of Needs As the Realization of Talent

The concept of motivation is often advanced as the answer to the question of how best to realize talent. Motivation is a complex construct and has long been the subject of study by, among others, social psychologists, personality theorists, sales and consumer psychologists, and vocational psychologists (Bohn and Super, 1969). An exhaustive analysis of this construct in its various formulations is beyond the scope of this review. However, one formulation that might prove fruitful for the present purposes is one based on the concept of needs. There is abundant literature to support such an expectation. For example, Herzberg and his associates (1957) reported that different needs were related to job satisfaction and to intrinsic work motivation than those needs related to job dissatisfaction. Vroom (1960) found a relationship between job satisfaction and various personality factors, such as needs for independence or authoritarianism. Roe (1956) concluded that vocational choice was influenced by needs resulting from particular kinds of childhood experience. Schaffer (1953) investigated the extent to which needs were met in various occupations and their relation to job satisfaction. Walsh (1959) studied the effects of needs on response to job duties.

While much research has focused on the relationship among needs, job satisfaction, and work motivation, less research has been done on the origins or development of such needs. Among the few that might be mentioned: Gray (1974) investigated the vocational needs of high school students and need stability over the high school years. Super (1969) developed the Work Values Inventory to study the development of values (which he relates to needs) in the adolescent years. Only one study was found (Cleland & Peck, 1959) that examined any developmental correlates of work motivation as reflected in job satisfaction, but, unfortunately, the validity of this study's results is questionable because of the extremely small sample used in the study.

Needs, then, represent one approach to understanding motivation, which, in turn, is one key to the fullest realization of human talent. As the next chapter will show, there is growing empirical support for the hypothesis that needs are implicated in work motivation and that work motivation is a condition for the realization of human potential. However, there is less that is known about how needs originate and how they develop. For vocational educators, whose basic mission is to facilitate the realization of human talent, knowledge of the origins and development of vocational needs is of the highest order of importance.

Purpose of the Study

The ideal approach to investigating the origins and development of vocational needs would be through a longitudinal study. However, such a study was not possible for the present investigator to undertake because of time and resource constraints. The alternative was a cross-sectional approach. A cross-sectional study would show snapshots, as it were, of the development of needs at particular points in time. An analysis of life history correlates of such needs would provide clues to their origins.

The purpose of this descriptive cross-sectional study, therefore, was to contribute to the body of knowledge about the development of vocational needs. Specifically, the study addressed two major questions:

1. What are the vocational needs of high school students?
2. What are the life history correlates of such vocational needs?

To explore these questions, over 1,750 high school students in grades 8 through 11 were administered a measure of vocational needs, the Minnesota Importance Questionnaire (MIQ; Lofquist and Dawis, 1969), and a questionnaire designed to elicit life history information, the Student Information Blank (SIB; Flanagan, 1960).

Limitations of the Study

1. While there is good reason to believe that the sample used in this study is broadly representative of the national high school population, the failure of some students and schools to respond indicates that the results of this study cannot be generalized to the high school population.

2. While the MIQ has demonstrable validity and reliability, it does not purport to measure all of the need factors that may be important to human satisfaction. Therefore, generalizations about the need factors in this study should be limited to the 20 needs specifically measured by the MIQ.
3. While the SIB provides broad coverage of an individual's life history, it does not include all of the important factors that may contribute to an individual's need development.
4. This study was intended to be exploratory, and its results should be considered descriptive in nature. Any generalizations beyond the present sample should be undertaken only with extreme caution.

Definition of Terms

The following terms are used in this study in very particular, circumscribed ways, and to aid the reader, their definitions are presented below:

Correspondence:	A relationship in which an individual and an environment are mutually responsive.
Correspondence in the Work Setting:	A relationship in which an individual fulfills the requirements of a work environment, and the work environment fulfills the requirements of the individual.
Interests:	Preferences for activities, deriving from the interaction of an individual's needs and abilities.

Life History:	Information about a person's past experiences and environments, including such items as hobbies, out-of-school activities, organizational and club memberships, dating habits, father's occupation, parents' financial status, and general health.
Preferences:	Description of an individual's norms for stimulus conditions or activities. These norms are derived from experience with stimulus conditions or activities, and the evaluation of how satisfying the experiences were.
Needs:	The importance (reinforcement value) of particular stimulus conditions to the individual. This differs from the usual concept of needs as states of deprivation.
Reinforcement:	The maintenance of responding or increase in the probability of responding associated with either the presence or the introduction of reinforcers.
Reinforcer System:	The need-satisfying characteristics of the work environment.
Reinforcers:	Stimulus conditions consistently associated with the maintenance or increase in probability of responding.
Satisfaction:	Fulfillment of the individual's requirements by the environment.

Stability:	Relatively little change over time in an individual's personality characteristics (needs).
Work Adjustment:	The continuous and dynamic process by which the individual seeks to achieve and maintain correspondence with the work environment.
Work Environment:	The setting in which work behavior takes place; can be described in terms of ability requirements and need-satisfying characteristics.
Work Personality:	The ability and needs of an individual that are most relevant to work behavior and the characteristic functioning of these abilities and needs in the work setting.
Minnesota Importance Questionnaire (MIQ):	An instrument developed for the Theory of Work Adjustment which is designed to measure an individual's vocationally relevant needs. Twenty vocational need dimensions are measured and are stated in terms of the relative importance to the individual of an occupational reinforcer.
Student Information Blank (SIB):	An instrument developed in Project TALENT which is designed to assess an individual's life history.

Total Circular Triads (TCT): An MIQ validity score that reflects inconsistent responses due to carelessness, poor motivation, random responding, lack of familiarity with the reinforcers, and/or instability of needs.

Hypotheses of the Study

The basic purpose of this descriptive study was to contribute to knowledge about the development of vocational needs. More specifically, the study addressed two major questions:

1. What are the vocational needs of high school students?
2. What are the life history correlates of vocational needs?

To explore these questions in a more detailed manner, the following research hypotheses were investigated.

Hypothesis One: There are no significant differences in vocational needs between high school males and high school females. (There are no significant sex effects on vocational needs.)

Hypothesis Two: There are no significant differences in vocational needs among students in the 8th, 9th, 10th, and 11th grades. (There are no significant grade effects on vocational needs.)

Hypothesis Three: There are no significant differences between males and females in the 8th, 9th, 10th, or 11th grades in their rankings of vocational needs.

Hypothesis Four: There are no significant interaction effects between grade and sex on vocational needs.

Hypothesis Five: There are systematic relationships between developmental life history factors and vocational needs.

Hypothesis Six: Similar sets of relationships between life history factors and vocational needs can be found between or among sex-by-grade samples.

Before describing the study in detail, a review of the literature is presented to serve as background for the study and to place it in context.

CHAPTER II

REVIEW OF THE LITERATURE

"Enough research has been done to suggest that there exist forces within each of us and outside of us that can operate on our will to perform and increase our ability to create." (Flanagan et al., 1962).

Project TALENT

During World War II, it was proven that aptitude tests successfully predicted whether a man could become a successful pilot, navigator, or bombardier, and that scores on these tests provided important clues for assigning military personnel to training in which they could succeed and to jobs in which they could utilize their aptitudes best. If it could be done for wartime occupations, why not for peacetime civilian occupations? In 1957, Dr. John Flanagan, who had a history of success in predicting occupational success for military personnel in military settings, developed a proposal for a study of sufficient scope as to provide the kind and amount of information needed for the same kinds of prediction in education, industry, and government, as in the military services. Project TALENT (Flanagan, 1960) was to be a large-scale multimillion-dollar study of approximately 1,000 schools and 450,000 students (country-wide) in grades 9, 10, 11 and 12, which encompasses a long-range follow-up program that was designed to answer questions about the realization and use of talent.

In 1960, the National Science Foundation, the National Institute of Mental Health, the Office of Naval Research, and the Cooperative Research Program of the U.S. Office of Education, after careful study of Flanagan's proposal, agreed to support the project. Project TALENT was launched under the direction of Dr. John C. Flanagan.

The basic assumption underlying Project TALENT was that students could be inspired to become personally motivated to realize their potential talent to the fullest. The student participants in the study were asked to take a battery of aptitude tests, including tests for foreign languages, clerical checking, mechanical visualization, memory, abstract reasoning, object inspection, and creativity, and a battery of achievement tests, including tests for English usage, effective expression, punctuation, spelling and capitalization, vocabulary, reading comprehension, social science literature, physical science, as well as simple arithmetic reasoning, elementary algebra, and advanced high school mathematics.

Students in the 9th, 10th, 11th, and 12th grades all completed the same tests, which took two full days of testing. They also completed a questionnaire that obtained information about the students' hobbies, out-of-school activities, organizational and club memberships, dating habits, father's occupation, parents' education, parents' financial status, health and some rather detailed questions on the student's plans for college, plans for military service, plans for marriage, and plans for careers. In addition, the questionnaire included: an Interest Inventory, with questions about interest in science, business, management, sales, social service, music, art, and other areas; a Student Activities Inventory of such topics as leadership, mature personality, personal neatness, sociability, calmness, and other traits; questions about school characteristics (course offerings, sizes of classes, training of teachers, training of principal, and so on); questions asking whether the school had a guidance program, what personnel they had in the program, what facilities for such a program, types of tests used, and future plans; and questions about counselors' time, philosophy, and training.

In the fall of 1974, a sub-sample of 8,000 students in 8th, 9th, 10th, and 11th grades were given the two-day test batteries. In April, 1976, a follow-up on each person tested in 1974 was to have taken place.

This dissertation is about a sub-sample of the 8,000 students and their developmental personal history data and activities.

The Realization of Human Talent

There is a formula that became popular after World War II which asserts that:

Performance = Ability x Motivation

Simple as this formula is, it appears to contain a lot of truth. "Ability" in this formula is really what was previously identified in this disseration as talent--the potential for learning new skills. According to this formula, the highest ability or the most exceptional talent will not be realized in performance unless there also is motivation. Motivation, according to the formula, is the necessary condition for the realization of talent.

Motivation has long been the subject of study by many psychologists, often with differing definitions and methods. Of all of these, two constructs have had clear implications for occupational psychology, and the resulting studies have led to findings that are relevant to the understanding of individual differences in occupational behavior. These motivational constructs, around which large bodies of literature have developed, are needs and interests. Both constructs are linked to motivation through the construct of job satisfaction, that is, job satisfaction is one indicator of the motivational action of needs and interests. In this review, the author will focus on needs and their relation to job satisfaction and work motivation.

Job Satisfaction and Work Motivation

Psychologists have long believed that behavior is determined by the interaction of individual and environment. However, most vocational psychologists have been more concerned with individual difference variables than with environmental variables, and an interaction approach has not been popular with them. There have been exceptions. Starishevsky and Matlin (1968) appealed for research studies and theories that describe both the individual and the work environment along the same dimensions. Sells (1963) argued that psychologists could not neglect the environment but must consider environmental variables if they were to understand human behavior.

Barker (1968) agreed that environments made a substantial contribution to behavior variance. Pervin (1968), in his review of the literature, concluded that occupational satisfaction could best be understood as resulting from the interaction of personality and environment variables. In previous work, Pervin (1967) found that student dissatisfaction was greater for students perceiving more discrepancy with the environment. Also, Pervin and Rubin (1967) in a related study found that the probability of students' dropping out of college for non-scholastic reasons was significantly related to the perception of discrepancy between selves and college.

Several other investigators have also conceptualized behavioral adjustment as a function of goodness of fit between individual and environment. Jahoda (1961) hypothesized that adjustment capacities depended upon the individual/environment match. Wechsler and Pugh (1967) found a higher rate of psychiatric patients among people who did not match their communities on certain characteristics. Sarason and Smith (1971) argued that research designs must consider behavioral effects of environmental and individual difference variables as well as their interactions. Although studies are not exactly numerous in relating behavior adjustment to individual/environment fit, there is, clearly, some research that supports this premise.

Several investigators have expounded on the importance of establishing and maintaining congruence between the individual's needs and those of the organization. These include: Argyris (1973), Lichtman and Hunt (1971), Friedlander and Margulies (1969), and

Schneider (1972). According to these authors, environments may or may not match the individual's personality characteristics; individuals congruent with their environments tend to be higher performers and to experience more job satisfaction than noncongruent individuals. Downey, Hellriegel, Phelps, and Slocum (1974) used a multivariate design to test the general congruency proposition that personality interacts with perception of the organization's climate to influence job satisfaction and performance. They found (like Pervin, 1968) that congruency is an important determiner of job satisfaction, the latter being a function of the interaction between personality and perceived environment.

Vroom (1964) reported a consistent though statistically nonsignificant correlation between employee satisfaction and various measures of performance. Morse (1953) suggested that job satisfaction is a function of what workers expect from their jobs and what they get from their jobs. Similarly, Hulin (1966) conceptualized job satisfaction as the result of congruence between what individuals expected and what is experienced on the job. Wilensky (1964) defined "work alienation" as the result of worker/work incongruence. As can be seen, although these theorists use different terms, they in essence conceptualize job satisfaction as resulting from the interaction of individual and environment.

Schaffer (1953) examined the hypothesis that overall satisfaction would vary directly with the extent to which needs were satisfied on the job and was one of the first researchers to use the concept of need-fulfillment in the prediction of job satisfaction. Using Murray's (1938) list of needs as a basis for his research, Schaffer administered a questionnaire to a sample of 72 men employed in professional, clerical, and sales occupations. This questionnaire was designed to measure three variables: (a) the strength of 12 needs, (b) the extent to which these 12 needs were satisfied in the person's job, and (c) overall job satisfaction. Mean need satisfaction scores were then derived on an 8-point scale from "extreme like" to "hate." Support for the association of overall satisfaction with need satisfaction was obtained; Schaffer found a correlation of .44 between employees' overall satisfaction scores with their mean need satisfaction scores.

Brophy (1959) investigated individual/environment interaction and job satisfaction by asking 81 nurses to indicate on a rating scale the extent to which they possessed each of 49 different traits and the extent to which their job permitted them to express their traits. The sum of absolute differences between these sets of ratings was used as a discrepancy score to indicate the fit for each nurse to work environment. A correlation of -.41 was obtained when Brophy correlated these discrepancy scores with job satisfaction, thus indicating that reported job satisfaction decreased as a nurse's discrepancy with the job increased. However, Vessey's (1973) comparison of subject and supervisor perceptions of the work environment as a measure of predicted job satisfaction failed to support this hypothesis.

Kuhlen (1963) refined Schaffer's concept of job satisfaction using different measuring instruments. The Edwards Personal Preference Schedule (EPPS) (Edwards, 1954) was administered to 109 male and 95 female school teachers. The teachers also completed a questionnaire designed to obtain their estimates of the teaching profession's need/satisfaction potential for the 14 dimensions measured by the EPPS. When individual discrepancy scores were correlated with job satisfaction scores, correlations of -.25 for men and -.02 for women were obtained. The value for the men was significant ($p \leq .01$) but the value for the women was not. Kuhlen reported the results as supportive of the general hypothesis that satisfaction is the function of the agreement of individual needs and occupational need-satisfiers. Both Anastasi (1968) and Crites (1968) criticized Kuhlen's results because of the low reliability and poor validity of the EPPS.

An examination of counseling literature as well as psychological literature suggests an implicit consensus within the profession that individual adjustment is facilitated by a good match between individual and work environment. Parsons' (1909) three-step man-job matching model suggested: (a) a clear understanding of yourself, aptitudes, abilities, interests, resources, limitations, and other qualities; (b) a knowledge of the requirements and conditions of success, advantages and disadvantages, compensation, opportunities, and prospects in different lines of work; and (c) true reasoning on the relations of these two groups of facts.

One of the first theoretical uses of the congruency concept was in personality theory. Murray (1938) treated individual satisfaction as a function of the correspondence between needs of the individual and characteristics of the environment ("press"). In vocational interest measurement, the Strong Vocational Interest Blank (Strong, 1943) and the Minnesota Vocational Interest Inventory (Clark, 1961) were based on the assumption that job tenure is a function of the similarity of an individual's likes and dislikes and those of established members of occupations. More recently, Holland (1959, 1966) has looked at vocational choice from the focus of individual/environment fit.

The Theory of Work Adjustment

The Theory of Work Adjustment (Dawis, England, and Lofquist, 1968; Dawis, Lofquist, and Weiss, 1964) is based in part on Schaffer's work concerning need satisfaction. In commenting on Schaffer's work, Darley and Hagenah (1955) make the following statement.

> In principle, at least, Schaffer was seeking a common vocabulary which would on the one hand contain a set of dynamic needs...and on the other hand describe the capacity of jobs to meet these needs. These terms would then acquire meaning by their relations to the criterion of over-all job satisfaction. The next obvious step is for some investigator to devise a new kind of job analysis system--an analysis that gives at least a first approximation of the extent to which families of occupations can satisfy some accepted set of intrapersonal needs. (p. 169)

In a way, the Theory of Work Adjustment is a follow-up of the Darley and Hagenah research mandate in that it (much like Holland's theory) defines individual and environmental variables along the same lines, as well as provides instruments with which to measure these variables. The Theory of Work Adjustment goes beyond this mandate, however, in that it develops specific propositions about the relationship of individual/environment correspondence and job satisfaction. As an example, Proposition III of the Theory of Work Adjustment states:

> Satisfaction is a function of the correspondence between the reinforcer system of the work environment and the individual's needs, provided that the individual's abilities correspond with the ability requirements of the work environment. (p. 11)

In this theory, the individual is described in terms of work personality characteristics and the job is described in parallel work personality terms. Abilities and needs are the major variables defining the work personality, and ability requirement and reinforcer systems are the major variables defining the work environment. Of particular interest to this dissertation is the fact that the authors of the Theory of Work Adjustment defined needs as "preference for responding in certain stimulus conditions which have been experienced to be reinforcing" (1968, p. 8). It can be seen from this definition that the authors believed that the individual's previous response and reinforcement history (life history data/activities) is considered to determine the reinforcing value of the work environment.

The results of the research conducted on the Theory of Work Adjustment have been published in a series of monographs entitled Minnesota Studies in Vocational Rehabilitation. The Minnesota

Importance Questionnaire (MIQ; Gay et al., 1971) was developed to measure an individual's vocationally relevant needs. Twenty vocational need dimensions were established (based in part on Schaffer's 1953 study). Each of the 20 need dimensions is stated in terms of the perceived importance of an occupational reinforcer. In the MIQ, these 20 statements are compared with each other in the form of 190 pair comparisons. Also, the MIQ has an absolute judgment section in which each of the 20 statements is listed and the subjects are asked to respond by indicating whether the statement is "important" or "not important."

Several different methods were used to determine the "reinforcer system" for various jobs. The method of pooled ratings of experts produced some valid results (Weiss et al., 1964b); however, the method was abandoned when the authors recognized that agreement among "outside experts" was difficult to obtain for some reinforcement dimensions. An inferential approach also proved possible, wherein job satisfaction was used as the dependent variable and the 20 scales of the MIQ were used as the independent variables (Weiss et al., 1965) in a multiple regression analysis. Patterns of predictor variables were developed using this method, and these patterns were called Occupational Reinforcer Patterns (ORPs). These ORPs indicated the relative strength of each of the 20 need statements of the MIQ for the occupation measured. This method for developing a large number of ORPs was also found to be not feasible. Thus, a third method was introduced; this method used immediate supervisors of occupations as "experts" for the estimation of the relative strength of the 20 need-reinforcer statements. This method required the development of the Minnesota Job Description Questionnaire (MJDQ) (Borgen et al., 1968). The MJDQ is a self-administering instrument that utilizes the method of multiple rank orders to determine the relative strengths of the 20 need-reinforcer statements contained in the MIQ. Due to the rank order design of the instrument, the MJDQ (like the MIQ) includes an absolute judgment section where the rater is asked to indicate if each of the 20 statements is "descriptive" or "not descriptive" of the job being rated. Over 180 ORPs have been developed against which an individual's pattern of needs, as measured by the MIQ, can be compared and a prediction of job satisfaction or dissatisfaction can be made.

The Minnesota Satisfaction Questionnaire (MSQ; Weiss et al., 1967) was developed to measure an individual's job satisfaction. The MSQ contains the same 20 statements as contained in the MIQ. Subjects are asked to indicate on a five-point scale ranging from "not satisfied" to "extremely satisfied" their degree of satisfaction with each item. Also, an overall job satisfaction score is obtained by summing the scores of the scales of the MSQ.

Research involving the predicting of job satisfaction based on the Theory of Work Adjustment has yielded mixed results. The Betz (1968), Warren (1970), and Vessey (1973) studies were not promising. Warren found no significant relationship between need-reinforcer correspondence and job satisfaction for the subjects studied. Betz found two groups with significant correlations and one with no significant correlation. Vessey found significant correlations for two groups, but one was in the wrong direction. This study found one significant correlation in a positive direction, one significant correlation in the wrong direction, and one group with no significant correlation. It may be said that the Betz/Warren/Vessey studies warranted a reexamination of Proposition III of the Theory of Work Adjustment.

Cronbach and Meehl (1955) suggested three ways in which negative evidence might be interpreted: (a) the findings indicate that the experimental design failed to test the hypothesis properly; (b) the findings indicate that the test does not measure the construct variable; or (c) the findings indicate that the theoretical network which generated the hypothesis is incorrect. Vessey (1973) suggested further studies to validate the test instruments before considering any alteration of the theoretical network of the Theory of Work Adjustment.

With this research mandate in mind, as well as the challenge of reestablishing the validity of the Theory of Work Adjustment, Dawis and Rounds (1975) reanalyzed the Warren, Betz, and Vessey data. The authors found that the d^2 index used in all these studies was not the best measure of need-reinforcer correspondence. A number of other indices of correspondence were tried in the attempt to predict job satisfaction from need-reinforcer correspondence. Dawis and Rounds

(1975) succeeded in identifying a much more effective index resulting in findings that were supportive of Proposition III of the Theory of Work Adjustment.

The Theory of Work Adjustment meets the criterion of generating predictions that are confirmed when the relevant data are collected, and, in the opinion of one authority in vocational psychology (Crites, 1968), stands above the other interaction theories. The Theory of Work Adjustment propositions about job satisfaction are clearly stated in terms that can be studied empirically, and instruments are available to measure the variables involved. Other interaction theories do not provide specific propositions about job satisfaction or methods by which to study the propositions empirically. The Theory of Work Adjustment meets the criterion of completeness in that the other interaction theories can be included in it. Holland's (1966, 1971) six personality types can be developed from vocational needs as a second-order classification of individuals. Herzberg, Mausner, and Snyderman's (1959) intrinsic and extrinsic factors are already part of the MSQ. Roe (1957) and Vroom's (1964) valences are scale values on the MIQ. Based on its flexibility, stability, and completeness, the Theory of Work Adjustment was selected as the basis for the present study.

The Measurement of Needs

Although many job satisfaction studies were available for review at the time of the initial development of the Theory of Work Adjustment, the majority of those studies focused almost exclusively on the relationship between performance and satisfaction. Little consideration was given to any intervening variables or the measurement of those variables that might affect such a relationship. The basic assumption of the Theory of Work Adjustment, however, is that each individual seeks to achieve and maintain correspondence with the environment, and that achieving and maintaining correspondence with the environment are basic motives of behavior. Initial development of the theory necessitated the development of instruments for measuring variables in the theory and testing the propositions. One of these instruments was the Minnesota Importance Questionnaire (MIQ) developed specifically to measure vocational needs.

Albright (1978) and Zedek (1978) both summarize their reviews of the MIQ positively by stating that although the MIQ's predictive validity is still being tested, its concurrent, discriminant, and convergent validity are well demonstrated and compare favorably with those of similar instruments.

The first effort to measure vocational needs for the Theory of Work Adjustment was in the form of a 48-item, 12-scale instrument based on the work of Schaffer (1953). A description of this measurement is available in Minnesota Studies in Vocational Rehabilitation XVI, The Measurement of Vocational Needs (Weiss, Dawis, England, Lofquist, 1964). A modification of this initial instrument resulted in the MIQ which was designed to (a) increase the number of dimensions measured by the questionnaire, (b) increase the variability of the scores, and (c) increase the reliability of the scales. The first MIQ was in Likert form and consisted of twenty scales of five items each. In 1965 the MIQ was revised in order to try a paired-comparison format, and in 1967 it was once again revised in order to improve the MIQ scaling properties and administration time. A more detailed description of the evolution of the MIQ is available in the Manual for the Minnesota Importance Questionnaire (Gay, Weiss, Hendel, Davis, and Lofquist, 1971).

The Origin and Development of Needs

Much of the vocational psychology research concentrates on the construct of motivation as the realization of talent and advances the concept of needs as predictors of job satisfaction. Unfortunately, little research has been done on the origins and development of needs. Super's (1969) Work Values Inventory measured values which he related to needs in adolescent years. Only one study (Gray, 1974) measured the vocational needs and the need stability of students over high school years, using the MIQ. Cleland and Peck (1959) examined developmental correlates of work motivation as reflected in job satisfaction, but with an extremely small sample. Unfortunately, the validity of its results is questioned due to the small sample. Only one study (Meresman, 1975) investigated the origin of needs as reflected in the relationship between vocational needs and life history data.

Vocational educators and counselors who wish to intervene more effectively with their students need to learn more about the origins of needs. They must thoroughly understand the work personalities of their students in terms of relationships with the work environment. The acceptance of the Theory of Work Adjustment's definition of needs as "preference for responding in certain stimulus conditions which have been experienced to be reinforcing" makes knowledge of previous history a most critical factor in assessing the reinforcing value of potential work environments. Hardin (1965) and Meresman (1975) both stated that a longitudinal research design should be used to study the development and changes in needs and other job-satisfaction-related factors. Such a design allowing for periodic follow-up of a large group of subjects in order to measure needs at different points of time would obviously be ideal for gathering available valuable information about the origin and stability of needs. Such a study of the magnitude and scope of Project TALENT, although highly desirable, is not within the time and resource constraints of a private investigator. Therefore, a cross-sectional approach was used in this study with data on needs for four successive grade groups (8th, 9th, 10th, and 11th) being compared. In this way, photographs, so to speak, of the development of needs at different grade levels could provide clues as to the origins and development of needs.

The origins of needs might be examined through a study of their life history correlates. Therefore, the remainder of this review of the literature will focus on life history studies and their contribution to knowledge about vocational behavior.

Life History Data as Developmental Indicators

In reviewing the literature on life history correlates of vocational behavior, the author found that there were few studies about vocational needs. However, biographical correlates of vocational behavior have comprised an extensive area of inquiry for both vocational psychologists and industrial psychologists for about the last five decades. Most studies have focused on life history characteristics that distinguished between groups of individuals in different occupations.

In two related studies, Roe (1951, 1953) compared the developmental and demographic backgrounds of 22 eminent biologists and physicists and 22 famous psychologists and anthropologists. Each scientist was given a structured interview focusing specifically on recall of childhood-parent relationship and demographic information. Roe found several differences between physical scientists and behavioral scientists. The behavioral scientists expressed feelings of family and personal superiority in comparison with others. They reported less of a degree of parental overprotection and stated that they were quite rebellious and hostile toward their parents even in adulthood. On the other hand, the physical scientists all expressed an early interest in mathematics, chemistry, and physics. The theoretical research scientists reported a greater incidence of childhood diseases which resulted in long periods of isolation. Roe argues that there were more similarities than differences within this group. The majority of all scientists came from homes wherein the fathers were professionally employed, and although there was not an unusually large amount of reading during childhood, there was much encouragement for education in the home. Roe also found a great number of first-borns among these eminent scientists. Despite the numerous findings, Roe's studies have been criticized as being merely suggestive due to the use of vague interview questions, the lack of quantification and data analysis, the small sample size, and the lack of a comparison group.

Despite the fact that Roe's studies, which postulated a relationship between childhood satisfaction-frustration of needs and later vocational interests and choices, have been largely discounted, several studies in the late 1950's and 1960's were stimulated by the wealth of information that Roe reported. Roe (1957) suggested that overdemanding or overprotective relationships between parents and children tend to encourage children "towards people" later in life, while the casual neglecting or rejecting relationships result in an orientation "not towards people." (p. 217) According to Roe, "towards people" is represented by occupations in the service, business, general cultural, arts, and entertainment interest areas, while "not towards people" is represented by occupations in the organization, technology, outdoor, and science interest areas.

Grigg (1959) tested Roe's theory by using a 15-item developmental questionnaire to examine the dimension of person versus non-person orientation. Grigg's subjects were 24 graduate nurses in a personnel/supervision program (people-oriented group) and 20 graduate nurses in departments of chemistry, physics, and math who aspired to be researchers. Contrary to theory expectations, the nurses in personnel/supervision did not state that they had more childhood experiences of warmth, and the only significant differences between the two groups was that the supervisory nurses expressed more parental interest relating to friends and companions versus the nurses in the chemistry department who expressed more preference for gadgets and things. Roe (1964) criticized Grigg's study for choosing too closely related occupations in which "people" versus "things" may not be extreme enough to show a significant difference.

Nachmann (1960) compared retrospective information to distinguish between 20 law students, 20 graduate social work students, and 20 dental students. Life history data were accumulated from a set of structured tape-recorded interviews conducted by experienced clinicians. Based on Roe's theory, answers were coded to Roe's 13 hypotheses. A chi-square analysis indicated several significant differences—lawyers and dentists tended to report fathers who were authoritarian, while social workers frequently reported fathers who were unable to make decisions for the family. Also, the social workers' mothers were more often reported working outside the home than mothers of the other two groups, and social workers' mothers also were more likely to discipline and administer punishment than their fathers did. The law students tended to report more self-discipline, while the dental students reported an emphasis on submission to authority. In contrast with other groups, families of dental students were more often conventional, conservative, politically inactive, and formally religious. Nachmann's study was severely criticized because of methodology, e.g., the interviewers were aware of the researcher's hypotheses before their interviews. Also, quantitative data were not presented for the study.

Negative findings were reported in a study by Hagen (1960), who was unable to find a relationship between men entering various occupations and family climate during childhood. Utton (1962) in an all-woman sample found no significant differences between his groups.

However, Rabkin (1969) argues that retrospective studies of early childhood attitudes and family interpersonal relations are subject to distortion due to faulty recall.

Chaney and Owens (1964) used a sample of 900 freshmen in agriculture and engineering schools and administered a 170-item multiple-choice life-history questionnaire. Subjects were dichotomized into high and low groups in general, research, and sales engineering interests. Significant differences in personal history items were found in all three groups. Those high on general engineering interests tended to report socially inactive parents who encouraged their offspring to achieve professional status. Also, they reported late dating or no dating at all and were uneasy about meeting people. They avoided school activities and were motivated by academic success. Students high in research engineering interests had similar experiences and preferences. Students high in engineering sales interests showed a greater people-orientation (in agreement with

Berdie's (1943) early findings of individuals high on sales interest being more likely to come from a more exclusive part of town) than students high in general or research interest with frequent participation in high school activities as well as frequent and early dating. They also stated that they were given more freedom by their parents to spend time away from home and with their friends.

Thomson's (1964) factor analytical study of interests of 545 engineering students confirmed the earlier research studies. Using the same predictor and criterion measures reported above, a principal factor analysis with an oblique rotation was performed that resulted in six factors: scientific interests, social leadership, urban orientation, intellectual ability, management orientation, and an uninterpretable sixth factor. Both research and general engineering students were found to display a similar pattern of interests, both loading negatively on management orientation and urban orientation and positively on scientific interests and management interests.

In a recent study by Klimoski (1973), 920 mechanical engineers were divided into three groups: research, management, and those who left the field. An analysis of variance found significant differences between the three groups on ten different biographical background factors. A post-hoc analysis indicated that the management group and those who left the field were more similar to each other and differed from the research group. Also, as in similar studies, the research engineer had a background of social introversion and tended not to participate in school activities while the sales engineering group was just the opposite.

Albright and Glennon (1961) reported supportive findings in their study of 141 physical scientists. They found 43 significant differences in life history items and concluded that their findings confirm the stereotype of the research-oriented scientist as being academically oriented and socially introverted while the supervisor scientists were outgoing and status-seeking. Whelan (1965) found research chemists and engineers to be "more creative" and cost accountants to be "less creative." In a factor-analytic study, Baehr and Williams (1968) discriminated between various occupational groups on the basis of the pattern of loadings on biographical factors. This study was unique because it assessed a heterogeneous group of occupations that included business executives, foremen, skilled workers, and school administrators among the fourteen different occupations.

The Predictive Utility of Life History Correlates

Life history correlates are not only useful in understanding the origins of personality factors but also useful in predicting future events. Following is a discussion of the various research studies that investigated the vocational relevance of life history correlates.

Life History Correlates of Academic Achievement

Studies of life history correlates of academic achievement have been numerous. For example, in a comprehensive review of 71 studies Freeberg (1967) found that life history information can effectively predict academic achievement. When a limited definition of achievement such as freshmen grades was used, correlation between aptitude scores and high school grade-point averages with freshman grades was small (Myers, 1952; Webb, 1960). Anastasi, Meade, and Schneiders (1960) found that when a broader definition of academic achievement was used (other than college grades), they were able to develop a life history inventory that predicted college achievement with a coefficient of .55 in cross-validation, and yet had little relationship to college grades. Freeberg (1967) concluded that life history information is more useful in predicting academic success.

Owens and Charles (1963) completed a classic 30-year longitudinal biographical inventory study of life history correlates of age changes in mental abilities. This study included 96 males who were tested as entering college freshmen in 1919, tested again in 1950, and retested in 1961. The authors used two instruments--the Army Alpha and the "Life Experience Inventory" (229 items, including 113 noncontinuous and 116 continuous variables measuring health, job satisfaction, community surroundings, education, home surroundings, external interests, self-evaluation of skills, religion, values and philosophy of life, hobbies and recreational activities, self-description, feelings about retirement, and classification).

The Guilford (1954) factorial analysis of the Army Alpha examination was used by Owens and Charles to develop difference scores for three components and total score over the two time periods--1919 to 1950 and 1950 to 1961. The authors concluded that individuals maintained their same relative positions within the group irrespective of the nature of the difference score utilized for the Army Alpha. Also, they found that: (a) a life history pattern of socio economic success was highly related to a better than average maintenance of total and reasoning scores from age 20 to age 50; (b) a life history pattern of intelligence was highly related to a better than average maintenance of total, verbal, and reasoning scores from age 20 to 50, and to reasoning score from age 20 to age 50; (c) a life history pattern of physical vigor was highly related to a better than average maintenance of numerical score from age 20 to 50; (d) a life history pattern of introversion was highly related to a better than average maintenance of total score from age 50 to 60; and (e) a life history pattern of egocentric independence was highly related to a better than average maintenance of numerical score from age 20 to 50 and 50 to 60; it was also related to failure to maintain verbal score from age 50 to 60. Incidentally, the Owens and Charles study not only has great significance as a study of life history correlates of academic achievement but also attests to the importance of experimental patterns of living for the aging and for adult education.

Only a few studies have analyzed developmental and demographic factors that consistently relate to academic success. Duff and Siegel (1957) compared male and female, high and low ability, overachievers and underachievers, in terms of background factors. They found significant differences among the four groups; high-ability female overachievers were generally found to conform socially, to participate more actively in religious activities, and to be less active in aesthetically derived activities than were high-ability female underachievers. Different findings were obtained for the males. Low-ability overachievers were more likely to participate in intellectual and political activities than other males.

Holland and Astin (1962) assessed biographical predictors of college achievement in academic, artistic, scientific, and social areas. In addition to life history information, in this short longitudinal study a battery of personality and interest tests was also administered (some of the same components included in Project TALENT). Social achievers in college tended to exhibit artistic achievement, hold a number of elective offices, win honors, and win debate and other public speaking contests, while artistic achievers tended to participate in creative activities in high school. Scientific achievers engaged in creative activities and exhibited high math aptitudes in their high school careers. Academic achievement was associated with high GPAs and restrictive parental attitudes and, in a later replication study (Holland and Nichols, 1964), with high school leadership activities.

Life History Correlates of Work Performance

Studies of life history correlates of work performance have also been numerous. In most of these studies (not all, however) biographical data were secured from application blanks which, of course, focus more on demographic and concurrent factors than on developmental items. Those discussed here are developmental and concurrent items.

Of historical interest is an early published study of the life history correlates of insurance salesmen's performance (Goldsmith, 1922). Goldsmith weighted an application blank on 502 salesmen (previously developed on 34 salesmen). The criterion was amount of insurance sold in terms of dollar volume. Using a three-criterion grouping ("failure," "borderline," and "successful"), she weighted nine life history factors related to success (marital status, education, service, insurance coverage, club membership, previous life insurance experience, "self-confidence in selling insurance," age, previous occupation, categorized as social or nonsocial). Goldsmith reported that the weighted history blank eliminated at least 54% of "failures" and left an incredible 84% of the "successes." Several of the items she used have been found still to be significant predictors of tenure in recent studies.

Chambers (1964) compared highly productive, eminent research scientists with research scientists who were not eminent, but were matched on other relevant variables. The author found several items that significantly discriminated between the two groups: eminent scientists generally had fathers who were professionals, were graduated from high school at an early age, and had families who were individualistic and independent. In a separate analysis, eminent scientists reported having considered their families superior to others, shunned high school sports, and excelled in math. They also were generally found to be a middle or older child.

Buel (1965) developed a weighted biographical inventory to predict the research competencies of 132 pharmaceutical workers, using a group of judges to identify those persons who were making the most original and lasting contributions to research. On cross-validation, significant correlations were found between the weighted biographical inventories and research competencies, generally ranging in the .40's and .50's for different keys. In a related study (Buel, Albright, and Glennon, 1966), a biographical inventory developed on petroleum industry workers was found to be predictive also of pharmaceutical workers.

Taylor and Ellison (1967) developed a biographical inventory for predicting performance ratings and output of 354 N.A.S.A. scientists. Criteria used included publications and patents, supervisory ratings, and several checklists of productivity and creativity. The inventory included 300 multiple-choice items that covered developmental theory, parent and family life, academic background, adult life, and interests. In a double-cross-validation design, the average cross-validation coefficient was .55. The authors found adult life and interests to be more predictive than parent and family life and academic background. In two additional studies, the same authors cross-validated the same items on new samples resulting in correlations in the .40's. Highly successful and creative scientists were described as self-confident, independent, and academically oriented since early adolescence.

A study of performance in newspaper retail advertising men was completed by Auclair (1958), who attempted to develop a keyed application blank that would successfully predict their performance. Subjects were divided into high, medium, and low criterion groups based on supervisor ratings and further divided into three age groups and into a development and criterion group. On cross-validation, significant biserial correlations were found for the middle and older groups (.32 and .27, respectively) but not for the youngest.

McClelland and Rhodes (1969) found the biographical inventory to be predictive of the work performance of hospital aides and orderlies. Kavanaugh and York (1972) identified several developmental factors that were predictive of middle managers' performance (reporting happiness in childhood, size of high school attended, rate of physical growth in teens compared with others, family economic status, and size of undergraduate school).

There has even been a group of studies analyzing life history factors predictive of successful scuba divers. Helmreich, Bakeman, and Roland (1973) developed a weighted biographical inventory (developmental and demographic in character) that predicted performance in a scuba diving training course. The authors found that receiving parental affection, high school class rank, good health in adolescence, athletic honors, and birth order were all significant predictors. Radloff and Helmreich (1968) reported that birth order was significantly related to diving performance on the Sealab expeditions; first-borns were reported to log significantly less diving time and made fewer sorties. Biersner and Ryman (1974) used a biographical inventory, a health inventory, and an attitude survey to predict success in Navy scuba diver training (similar to the Helmreich et al. 1973 design). These authors used a multiple regression procedure, and the prediction equation cross-validation coefficient was .39 (lower than the Helmreich et al. findings). Thus the significant biographical items only partially replicated the findings of the other research group. Success in the program was associated with parental criticism, higher education, and having fewer older brothers.

Life History Correlates of Creativity

Studies of childhood creativity have constituted an extensive research topic in developmental psychology. However, only a few studies have used the biographical inventory in a retrospective analysis of childhood experiences and as a predictor of adolescent or adult creative behavior.

MacKinnon (1962), after a review of the literature, defined creativity by three elements: (a) novelty--adaptive or reality-based behavior, a sustained effort resulting in a product; (b) statistically infrequent or unusual ideas, which is problem-solving oriented; and (c) criterion or creative production rather than creative potential oriented.

Helson (1965, 1966, 1967) assessed background factors discriminating creative from noncreative women. Using a sample of 35 Mills

College seniors rated for their creativity in the arts, sciences, and humanities by three faculty members, the author found that the developmental areas associated with creativity were pleasure from imaginary play, artistic expression, tomboy activities, impersonal and abstract activities, and social play (negatively correlated). Creative subjects indicated more contact with their mothers. Dauw (1966) did not agree with Helson's findings; this author found that highly creative females tended to engage in more activities and hobbies with their fathers than with their mothers while highly creative males engaged in more activities with their mothers, than less creative adolescents.

Anastasi and Schaefer (1969); Schaefer (1967, 1969, 1972); and Schaefer and Anastasi (1968) have assessed adolescent boys and girls in art, literary endeavors, and science using biographical correlates of creativity. In one of the studies (Anastasi and Schaefer, 1969), 400 mainly senior female high school students were divided into four groups: creative art, control art, creative writing, and control writing. The criteria of creativity were teacher nomination on the basis of judged creative output and a score above the minimum cutoff on the Guilford Alternative Uses and Consequences Test. Across the groups, the creative adolescents could be distinguished by a greater frequency of reporting: becoming absorbed in hobbies, having continuing interests in their respective fields, having reported career plans, having gained recognition through exhibitions, publications, prizes and awards, having reported imaginary friends in childhood, having fathers with college educations, and having family members who played musical instuments.

Using a large sample of 994 National Merit Finalists, Holland (1961) studied the relationship of a number of personality and life history factors to creativity and achievement. Students were asked to fill out a checklist of creative accomplishments (original papers, winning awards, publishing poems, stories, receiving high ratings in contests). Boys with high scores on scientific creativity were more frequently first-born or only children, were physically active, and reported fathers who valued their sons' curiosity. Artistic creativity in boys was negatively correlated with dominant mothers who rejected their housewife roles. While similar findings on artistic creativity were found, no significant relationships between scientific creativity and biographical information were found for girls.

Nichols (1964) found a negative relationship between the authoritarianism of the family atmosphere and adolescent academic performance, and Halpin (1973) found creativity in student teachers to be related to parental control factors in childhood.

Life History Correlates of Occupational Tenure

This topic has been dominated by studies of the weighted application blank (WAB). England (1971) cited 26 studies of successful WABs. Most of the studies reviewed in this section have used a relatively small number of demographic and contemporaneous variables as predictors. Developmental variables, although important, have not been popular because most researchers have been concerned primarily with developing highly predictive instruments for industrial use rather than adding to the construct validity of a psychological theory of vocational development.

In an early study, Brown and Ghiselli (1947) tried to develop a keyed application blank to predict tenure for motor coach drivers. Using a sample of 363 subjects, the authors found only age and marital status to be related to tenure. Tiffin, Parker, and Haberstart (1947) compared 27 long-tenure employees (nine months or longer) with 60 short-tenure employees (three months or less). They found age, education, marital status, and number of dependents to be significant discriminators between the two groups, and "ideal" long-tenure employees were described as "older," having less education, married, and having more dependents in comparison with short-tenure employees.

In contrast to most of the studies cited in this review, Schuh (1967) did not find many significant biographical correlates of tenure for salesmen. In this study, Schuh correlated 30 life history factors and the Wonderlic Personnel Test with tenure for 151 male, salaried, wholesale food salesmen. Only church attendance was predictive. However, critics accused Schuh of not providing a replication.

Welsh (1960) found fifteen items that significantly discriminated between the long- and short-tenure instructors in psychology, English and chemistry. The biographical items fell into three categories: "background characteristics" occurring prior to college entry, "mobility characteristics," and "affiliative characteristics."

Taylor and Weiss (1972), in their study of the relationship between satisfaction and tenure, found that 3 of 11 biographical predictors were significantly related to tenure for a sample of 475 employees in a discount chain store in which 20% of the personnel had left within a year. However, it was found that discriminant functions based on these three factors did not improve the overall "hit" rate over the base rate of 80%. In explaining these negative results, the authors note that many application blank items found effective in past studies (England, 1971) were not included in the study.

Mosel and Wade (1951) used WABs to compare 85 short- and long-tenure female sales clerks in a department store (long-tenure, more than one year; short-tenure, less than six months). Twelve of the 13 items were found to be significant discriminators between the two groups. Using a new sample of 100 long-tenure and 83 short-tenure employees, a tetrachoric correlation of .41 was found between the WAB and the criterion.

Dunnette and Maetzold (1957) used a WAB to predict tenure for seasonal employees in a rural setting. The WAB discriminated the long-tenure group from the short-tenure group with only a 16% overlap. Also, it was found that the same WAB could be used successfully to discriminate between tenure groups among other workers in other locations.

Kirchner and Dunnette (1957) used the WAB procedure to discriminate between long- and short-tenure female clerical employees at a large midwestern industrial firm. On cross-validation only 7.5%

overlap between the groups occurred, and the WAB correlated .42 with the criterion. The "ideal" long-tenure employee was described by the authors as young, single, from local area, some education beyond high school, owning neither a car nor furniture, left last job for advancement, made a low salary on the last job, had previous job, and was employed on last job for over two years.

Lee and Booth (1974) developed a WAB to predict tenure of clerical workers which cross-validated with a point-biserial correlation of .56. These authors analyzed their findings one step further than most previous studies by showing the actual dollar savings achieved by employing WABs in comparison with a random selection procedure. The authors calculated a savings of $250,000 over a 25-year period based on the rate of employee turnover, selection ratio, and cost of new personnel training.

Cleland and Peck (1959) studied life history factors that discriminated long-tenure institution ward attendants (N=36) from short-tenure institution ward attendants (N=24). The study was unique in the extreme tenure criterion used (the long-tenure group included attendants in residence for more than 10 years, while the short-tenure group were in residence for less than six months). All subjects were given a battery of psychological tests and a biographical interview. Data were also obtained from the hospital records and analyzed. In contrast to the short-tenure group, long-tenure subjects came from rural backgrounds (parents in farming or ranching), had strict, dominant fathers, submissive mothers, had personal responsibility at an early age due to family death or divorce, had positive parental feelings, and were older at the onset of employment. However, more similarities than differences were noted. Both groups tended to come from upper-lower socio economic status backgrounds, from large families, had similar educational backgrounds, and were assessed as functioning at approximately the same intellectual level. Because the sample was small, the findings need to be replicated in further research.

The Meresman Study

Meresman (1975) conducted the only reported study of the biographical correlates of MIQ scale scores. Using a biographical information (BI) blank of 40 items, he analyzed the relationships between biographical factors and MIQ scale scores for a group of 381 adults. He also attempted to develop prediction equations (using multivariate techniques) for biographical items in the prediction of need scores. While the development-group prediction coefficients were significant for all but one MIQ scale, the cross-validation coefficients were significant for only three MIQ scales. Because this study was on the MIQ as a need measure, and on an adult sample, it represents the natural end-point of the presumed development of needs during the adolescent years and as such is an important study against which to contrast the findings of the present study.

Summary

This study originated in the recognition of the need to realize human talent. Talent was defined as potential for learning to perform various activities important in our culture. Motivation was viewed as the key to the realization of talent. Need-satisfaction, in turn, was seen as one approach to motivation. The individual/environment interaction approach to the explanation of satisfaction was examined. Although many studies reviewed offered support for the interaction approach, no particular interaction theory was consistently preferred over others.

According to Hall and Lindzey (1970), "...acceptance or rejection of (a theory) is determined by its utility, not by its truth or falsity" (p. aa). These authors further state that utility has two components--verifiability and comprehensiveness. Verifiability refers to the capacity of the theory to generate predictions that are confirmed when relevant data are collected, and comprehensiveness refers to the scope or completeness of the theory's derivations.

Based on these criteria, the Theory of Work Adjustment stands above the other interaction theories (Crites, 1969). The propositions of the Theory of Work Adjustment about needs and satisfaction are clearly stated in terms that can be empirically studied. Also, instruments are available to measure the variables involved in the prediction of need satisfaction. Particularly singled out for this study is the measurement of needs with the MIQ instrument. The Theory of Work Adjustment meets the criterion of comprehensiveness in that other interaction theories (Holland, Roe, Herzberg, and Vroom, as already reviewed) can be included in it. Finally, the Theory of Work

Adjustment was selected for this study because it is easy to understand and use in working with individuals.

If need satisfaction underlies motivation and motivation facilitates the realization of human talent, it is important for vocational educators to know about the origins and development of needs. Unfortunately, a review of the literature reveals a lack of such knowledge. The study of needs development, therefore, assumes great importance.

Hardin (1965) states that a genuinely longitudinal research design should be used to study the changes in needs, perceptions of jobs, and job satisfaction because only such a design would give valid information about the development of these variables over time. Thus a longitudinal design seems most appropriate to answer many of the questions occasioned by the lack of research studies.

Because the nationally supported longitudinal study, Project TALENT (Flanagan, 1960), is still in active progress and will continue to be in progress until 1980, the author of this study felt that it might be feasible to contact Dr. John Flanagan to inquire about the possibility of using a portion of the Project TALENT sample in a longitudinal study of the life history correlates of needs. Dr. Flanagan was more than cooperative in accommodating the study, and encouraged the author to use part of the Project TALENT sample of 8,000 8th, 9th, 10th, and 11th grade students who were tested in 1977 and were then expecting to take part in their one-year follow-up. This happy circumstance led to the present investigation.

While a truly longitudinal study of needs was not possible, a cross-sectional study of high school student needs might indicate developmental trends. Also, a study of the life history correlates of such needs might shed light on the origins of needs.

The remainder of the review of literature for this study examined the utility of life history correlates in:

a. Differentiating among occupations: (Roe, 1951, 1953, 1957; Nachmann, 1960; Dunnette, 1955; Kulberg and Owens, 1960; Chaney and Owens, 1964; and Thomson, 1964).

b. Predicting academic achievement: (Freeberg, 1967; Fishman and Pasanella, 1960; Myers, 1952; Webb, 1960; Anastasi, Meade, and Schneiders, 1960; and Holland and Astin, 1962).

c. Predicting work performance: (Goldsmith, 1922; Smith, Albright, Glennon, and Owens, 1961; Chambers, 1964; Buel, 1965; Auclair, 1958; Baehr and Williams, 1968; McClelland and Rhodes, 1969; Kavanaugh and York, 1972; and Helmreich, Bakeman, and Roland, 1973).

d. Predicting creativity: (MacKinnon, 1962; Helson, 1965, 1966 and 1967; Dauw, 1966; Anastasi and Schaefer, 1969; Schaefer, 1967, 1969 and 1972; Schaefer and Anastasi, 1968; and Holland, 1961).

5. Predicting occupational tenure: (England, 1971; Brown and Ghiselli, 1947; Tiffin, Parker, and Haberstart, 1947; Kriedt and Gudel, 1953; and Welsh, 1960).

Finally, the Meresman (1975) study of biographical correlates of MIQ need scores for an adult sample was singled out as the important contrast for the present study.

CHAPTER III

METHODOLOGY

This chapter contains a description of the methodology employed to investigate the research questions and hypotheses. This description is presented in the following order: The Research Instruments, Data Collection, Description of the Sample, and Data Analysis.

The Research Instruments

The vocational needs of the 1,760 subjects of this study were assessed by means of the 1967 revision of the Minnesota Importance Questionnaire (MIQ), an instrument developed by the Work Adjustment Project (Lofquist & Dawis, 1969). The MIQ is a 210-item paired-comparison instrument that measures the relative strengths of 20 work-related needs (see Table 1). The first 190 items are comparisons of all possible need pairs in which subjects must indicate which of the two needs in each pair they consider more important. From these data, relative scale values are obtained for each need. In the last 20 items, subjects are asked to make absolute, rather than comparative, judgments of whether a need is important or not important in an ideal job. These judgments are used to adjust the scale values to each individual's "zero point." The resulting adjusted scale values can range from -4.0 to +4.0 for each of the 20 needs.

Inconsistent responses, which may have been due to carelessness, poor motivation, random responding, lack of familiarity with certain

Table 1

MIQ Acronyms, Scale Names, and Need Statements

Acronym	Scale Name	Need Statement
AU	Ability Utilization	I could do something that makes use of my abilities.
Ach	Achievement	The job could give me a feeling of accomplishment.
Act	Activity	I could be busy all the time.
Adv	Advancement	The job would provide an opportunity for advancement.
Aut	Authority	I could tell people what to do.
CPP	Company Policies and Practices	The company would administer its policies fairly.
Com	Compensation	My pay would compare well with that of other workers.
CoW	Co-Workers	My co-workers would be easy to make friends with.
Cre	Creativity	I could try out some of my own ideas.
Ind	Independence	I would work alone on the job.
MV	Moral Values	I could do the work without feeling that it is morally wrong.
Rec	Recognition	I could get recognition for the work I do.
Res	Responsibility	I could make decisions on my own.
Sec	Security	The job would provide for steady employment.
SSe	Social Service	I could do things for other people.
SSt	Social Status	I could be "somebody" in the community.

Table 1 (Continued)

MIQ Acronyms, Scale Names, and Need Statements

Acronym	Scale Name	Need Statement
SHR	Supervision-Human Relations	My boss would back up the workers (with top management).
ST	Supervision-Technical	My boss would train the workers well.
Var	Variety	I could do something different every day.
WC	Working Conditions	The job would have good working conditions

reinforcers and/or instability of needs, are reflected in a Total Circular Triad (TCT) score calculated by the Kendall formula (Kendall, 1948, p. 125). A circular triad score is an "illogical" sequence of choices (A over B, B over C, C over A). The total number of such "illogical" choices indicates factors that may invalidate an MIQ profile. Since TCTs of 255 or higher indicate invalid profiles, all profiles with such TCT scores were eliminated from analysis in this study. For the remaining profiles, the TCT score was treated as a 21st MIQ scale.

The MIQ requires approximately 30 to 40 minutes' completion time. The reading difficulty level of the MIQ statements has been established as being at the fifth grade level (by the Flesch formula, see Weiss, Davis, England & Lofquist, 1964a, p. 20).

Evidence of validity for the 1967 MIQ has been presented by Gay et al. (1971) and Stulman (1974) and has been reviewed favorably by Albright (1978) and Zedek (1978).

Evidence for both the stability (test-retest) and the internal consistency reliability of the MIQ has previously been reported by Hendel and Weiss (1970). In an analysis of the stability of MIQ scale scores, the authors found median correlations ranging from .89 to .48 for intervals ranging from immediate retest to ten-month retest intervals for various samples of largely adult individuals. In the same study, the authors found the stability coefficients for MIQ profiles to range from .70 to .95. Moderately high levels of internal consistency for the MIQ were also found when the authors used nine samples from different populations. Median Hoyt reliability coefficients ranged from .77 to .81.

The life history data items used in this study were obtained by using an updated version of the original Project TALENT Student Information Blank section of the Project TALENT Test Booklet B, pages 10-32. Flanagan and Jung (1971) reported that the original Project TALENT Student Information Blank was a 396-item inventory. A copy of the specific questions and response choices in the revised Student Information Blank Section of Project TALENT Test Booklet B is included in Appendix A of this study. The 281-item Student Information Blank (SIB) used in this study sought information about the subjects' hobbies, health, out-of-school activities, organization and club memberships, dating habits, study habits, parents' occupations, parents' education, and parents' financial status. Minor SIB item changes that were made included (a) the elimination of Part IV (detailed questions about the students' plans for college, plans for marriage, plans for their careers); (b) the updating of salaries to reflect current ranges; and (c) the addition of publications currently being published, as well as the elimination of magazines no longer being published.

The most complete description of the development of the SIB is in The American High School Student by Flanagan, Davis, Dailey, Shaycroft, Orr, Goldberg, and Neyman (1964). Indirect evidence for the stability of the MIQ is presented by Flanagan and Jung (1971). They reported comparisons of SIB response percentages for 36 items—19 of which were included in the present version of the SIB--based on approximately 13,000 students tested in the 1960 Project TALENT survey (Flanagan, Daily, Shaycroft, Gorham, Orr, and Goldberg, 1962) and approximately 12,800 eleventh grade students tested in the 1970 Progress in Education Survey. Response distribution shifts were, according to the researchers, negligible, suggesting that the SIB is a reliable (stable) measurement device. Reliabilities for the SIB are not reported in the available literature.

Indirect evidence for the predictive validity of the SIB is reported by Lohnes (1966) and Cooley and Lohnes (1966). Both report the existence of moderately strong, longitudinal predictive relationships between "motive" factors--developed from factor analyses of SIB and Project TALENT vocational interest items--and such criteria as subsequent high school dropping out, choice of college major, occupational group membership, and marital status.

Data Collection

Data were collected for this study from a sample of students then enrolled in the 8th, 9th, 10th, and 11th grades in schools located in different parts of the country. The majority of this sample represented a portion of the larger pool of Project TALENT subjects.

The portion of the Project TALENT sample used in this study was made available to the investigator by Project TALENT's principal investigator, Dr. John C. Flanagan. In April, 1976, the investigator visited with Dr. Flanagan at the American Institute of Research in Palo Alto, California, to discuss the proposed research. Dr. Flanagan enthusiastically supported the study and encouraged the use of the Project TALENT sample to conduct the study. A list of the participating schools as well as the name of the principal to contact for each school was provided. Besides this, Dr. Flanagan asked the director of the project, Marjorie Geesaman, to write to the participating schools and to introduce them to this study. Copies of the letter and enclosure mailed to each of the schools are included as Exhibits 1 and 2, Appendix B.

Following the initial contact by Dr. John C. Flanagan, the investigator telephoned each of the designated officials for the junior and senior high schools in the sample and asked whether their schools could be counted on to participate in the study. An initial contact form for the sample schools is included as Exhibit 3, Appendix B.

To compensate for the drop-outs from the original list of Project TALENT schools, four schools (three from the State of New Jersey, since state vocational funds were being used to finance the study, and one from the state of Iowa for convenience of location) were added to the Project TALENT sample of schools agreeing to participate. A copy of the letter sent to encourage the New Jersey schools that were recommended by the Vocational Education Division of the State of New Jersey to participate in the study is included as Exhibit 4 in Appendix B.

The telephone responses received from the potential sample schools served as the basis for assigning questionnaire sets for each grade level.

A confirmation letter sent to each school agreeing to participate in the study is included as Exhibit 5, Appendix B, and preceded the mailing of the SIB answer sheets (designed and printed by the California Test Bureau), the SIB booklets (keylined and printed by the University of Minnesota, Central Duplicating Services), and all MIQ materials (made available by University of Minnesota Vocational Psychology Research Unit).

Telephone progress checks were periodically made from the time the questionnaire sets were mailed until the time all completed materials were finally received.

Thank-you letters were then sent to all participating schools. If the school returned completed materials, the letter shown as Exhibit 6, Appendix B, was mailed, and if they had not returned the materials, the letter shown as Exhibit 7, Appendix B, was mailed to expedite the returns.

Description of the Sample

In this study, 3,860 test packets were mailed to 20 schools scattered through 14 states. SIB data were received for 2,591 students, and MIQ data were received for 2,367 students. Of the 2,367 MIQ returns, 513 of the completed MIQ questionnaires were invalid due to high TCT scores and faulty or missing responses. In addition, valid MIQ returns for 94 students did not have corresponding SIB data. As a result, data from only 1,760 students were available for analysis in this study.

Of the 1,760 students, 800 were males, and 960 were females. Across grade levels, there were 338 8th grade students; 298 9th grade students; 496 10th grade students; and 628 11th grade students. Fifteen schools were drawn from schools that were involved in Project TALENT-related studies and four schools were added, as described earlier. Eighteen of the participating schools reported student enrollments ranging from 350 to 2,100 students in seven rural, five urban, three inner-city, and three suburban settings. These data are presented in Table 2.

Data Analysis

The first step in the study was the compilation of summary data on the MIQ variables for the sample and for groups of students categorized by sex, grade, and sex within grade.

The next step was the investigation of differences in vocational needs between sex and grade groups. The MIQ scale values for the eight different groups (8th grade males, 8th grade females, 9th grade males, 9th grade females, 10th grade males, 10th grade females, 11th grade males, and 11th grade females) were subjected to a two-way analysis of variance with sex and grade as the two factors. This was done for each of the 20 scales as well as for the TCT scale.

The results of these two-way analyses were examined and the main effects and interaction effects of the independent variables (sex and grade) on the MIQ scale scores were assessed. The Scheffé procedure

Table 2

Demographic Information for Students Participating in The Study

Demographic Variable	Number of Students		Percent
Sex Group			
Male	800		45.5
Female	960		54.5
Total	1,760		100.0
Grade Group			
Eighth	338		19.2
Ninth	298		16.9
Tenth	496		28.2
Eleventh	628		35.7
Total	1,760		100.0
Area of School			
Inner City	3		16.7
Urban	5		27.7
Suburban	3		16.7
Rural	7		38.9
Total	18		100.0
	Mean	SD	Number of Schools
Number of Students Enrolled in the Schools	841	492	18

was used to evaluate the differences among the means of the grade groups. Means were examined for differences between the sex groups. Variance ratios were calculated to assess differences in variability between sex groups and among grade groups.

The next step in the analysis was to calculate rank correlations between sex and grade groups. For each group, the 20 MIQ scales were ranked from most important to least important on the basis of the means for each scale. Spearman rank correlation coefficients were then computed using the rankings of the MIQ scales for the respective sex and grade groups. Median profiles were drawn to describe pictorially the relative importance of the MIQ scales and to display the possible effects of extreme scores on the MIQ scale means. To obtain the median estimates, an alternate MIQ scoring program was used which yielded scale scores accurate to two decimal places (the usual scoring program yields only one decimal place scale scores). The median determinations were based on these scored results.

Finally, Pearson product moment correlations were computed between each scale and each SIB item. The following changes in the SIB items were made in order to attend to the problems of badly skewed distributions of responses, nonlinear relationships, and missing data:

a. Items were not included in the analyses when response distributions were badly skewed (i.e., when more than 85 percent of the respondents checked one response category).

b. Response categories were combined in order to obtain more symmetrical distributions (e.g., for item 205, responses A to C were combined into a "farm and ranch worker" category, responses D, H, and I were combined as a "semi-skilled" category, and responses L, M, and N were combined into "managers").

c. New variables were created when too many response options were given (e.g., for item 283 which asks whether or not students have a car of their own or one that is mostly for their use, only two responses, "yes" and "no," were retained).

d. Response categories were rearranged *a priori* in order to increase the likelihood of linear relationships with the MIQ scores (e.g., for item 169 which asks students to describe the building in which they live, response F (A One-Family House), the last response, was moved to precede response A (A Two-Family House), the first response).

e. Recodings were made for some data (e.g., "I don't know" was recoded 0 and treated as missing data).

A list of the acronyms used to identify the modified SIB variables can be found in Appendix C.

CHAPTER IV

RESULTS

This chapter describes the results of the study separately for each question and each hypothesis.

Question One: What are the vocational needs of high school students?

The vocational needs of high school students will be described for each of the following groups: All Students, Sex Groups, Grade Groups, Sex-Within-Grade Groups.

All Students

The data revealed that the mean MIQ scale scores of these high school students ranged from a low of -.25 on Authority to a high of +1.41 on Ability Utilization. The four most important vocational needs of these high school students were Ability Utilization, Achievement, Security, and Advancement. The four least important vocational needs were Authority, Independence, Social Status, and Activity. Social Status had the most variability (1.00); Variety and Moral Values had the next most variability (.90); and Achievement had the least variability (.63). These data are presented in Table 3.

Sex Groups

Data for the sex groups are also presented in Table 3.

Females. Mean MIQ scores for female students ranged from a low of -.37 on Authority to a high of +1.47 on Ability Utilization. The four most important needs for female students were Ability Utilization, Social Service, Achievement, and Security. The four least important

Table 3

MIQ Scale Means and Standard Deviations, by Sex Group

MIQ Scale	Male (N=800)		Female (N=960)		Total (N=1,760)	
	Mean	SD	Mean	SD	Mean	SD
AU	1.34	0.67	1.47	0.66	1.41	0.67
Ach	1.20	0.63	1.31	0.62	1.26	0.63
Act	0.14	0.81	0.32	0.77	0.24	0.79
Adv	1.23	0.74	1.17	0.73	1.20	0.73
Aut	-0.11	0.88	-0.37	0.80	-0.25	0.86
CPP	0.69	0.73	0.82	0.63	0.77	0.68
Com	0.68	0.83	0.53	0.80	0.60	0.82
CoW	0.67	0.66	0.69	0.67	0.68	0.67
Cre	0.78	0.80	0.81	0.76	0.80	0.78
Ind	0.12	0.85	0.05	0.83	0.08	0.84
MV	0.66	0.91	0.86	0.89	0.77	0.90
Rec	0.87	0.74	0.80	0.72	0.83	0.73
Res	0.85	0.77	0.71	0.79	0.77	0.78
Sec	1.23	0.79	1.21	0.76	1.23	0.77
SSe	0.93	0.86	1.37	0.81	1.17	0.86
SSt	0.28	0.98	0.17	1.01	0.22	1.00
SHR	0.60	0.76	0.59	0.70	0.59	0.73
ST	0.55	0.70	0.64	0.66	0.60	0.68
Var	0.42	0.91	0.48	0.89	0.45	0.90
WC	1.05	0.67	1.11	0.63	1.08	0.65
TCT	111.70	63.60	101.10	60.40	105.90	62.10

needs were Authority, Independence, Social Status, and Activity. For female students, Social Status had the most variability (1.01) and Achievement had the least variability (.62).

Males. Mean MIQ scale scores for male students ranged from a low of -.11 on Authority to a high of +1.34 on Ability Utilization. The four most important needs for male students were Ability Utilization, Advancement, Security, and Achievement. The four least important needs were Authority, Activity, Independence, and Social Status. Social Status had the most variability (.98) and Achievement had the least variability (.63).

Females Versus Males. On the average, both male and female students considered Ability Utilization to be the most important vocational need. However, they differed in their perceptions of the next most important needs. For males, Security and Advancement were the next most important needs, while for females, it was Social Service. For both groups, Achievement was ranked either third or fourth. No major differences occurred in the males' and females' perceptions of the least important needs, which were Authority, Independence, Social Status, and Activity. For both groups, Social Status had the most variability and Achievement had the least variability. In general, slightly less variability occurred for females than occurred for males.

Grade Groups

The data for each grade group are presented in Table 4.

Table 4

MIQ Scale Means and Standard Deviations, by Grade Group

MIQ Scale	Eighth (N=338)		Ninth (N=298)		Tenth (N=496)		Eleventh (N=628)		Total (N=1,760)	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
AU	1.22	0.69	1.46	0.64	1.42	0.67	1.46	0.64	1.41	0.67
Ach	1.06	0.63	1.25	0.60	1.33	0.63	1.32	0.62	1.26	0.63
Act	0.28	0.80	0.30	0.83	0.20	0.75	0.19	0.79	0.24	0.79
Adv	0.95	0.70	1.20	0.70	1.16	0.73	1.38	0.73	1.20	0.73
Aut	-0.09	0.87	-0.09	0.88	-0.34	0.83	-0.32	0.81	-0.25	0.85
CPP	0.60	0.70	0.82	0.69	0.76	0.65	0.83	0.68	0.77	0.68
Com	0.69	0.79	0.68	0.82	0.63	0.81	0.51	0.82	0.60	0.81
CoW	0.62	0.70	0.78	0.73	0.68	0.64	0.68	0.64	0.68	0.67
Cre	0.80	0.77	0.89	0.78	0.79	0.82	0.76	0.76	0.80	0.78
Ind	0.23	0.90	0.14	0.86	0.07	0.83	-0.01	0.80	0.08	0.84
MV	0.77	0.89	0.80	0.91	0.75	0.87	0.75	0.93	0.77	0.90
Rec	0.81	0.72	0.95	0.71	0.76	0.75	0.86	0.73	0.83	0.73
Res	0.77	0.80	0.81	0.78	0.76	0.80	0.80	0.75	0.77	0.78
Sec	1.09	0.77	1.29	0.82	1.21	0.68	1.27	0.82	1.22	0.77
SSe	1.12	0.81	1.20	0.86	1.11	0.84	1.18	0.83	1.17	0.86
SSt	0.45	0.99	0.37	0.94	0.12	0.98	0.12	1.01	0.22	1.00
SHR	0.50	0.78	0.62	0.73	0.53	0.65	0.69	0.75	0.59	0.73
ST	0.60	0.74	0.63	0.74	0.59	0.62	0.60	0.66	0.60	0.68
Var	0.55	0.92	0.44	0.98	0.39	0.88	0.46	0.86	0.45	0.90
WC	1.05	0.58	1.13	0.71	1.07	0.63	1.07	0.67	1.08	0.65
TCT	128.00	65.60	108.10	61.60	105.00	61.10	94.90	57.40	105.90	62.10

Eighth Grade. Examination of the data revealed that the mean MIQ scores for 8th grade students ranged from a low of -.09 on Authority to a high of +1.22 on Ability Utilization. The four most important needs for 8th grade students were Ability Utilization, Social Service, Security, and Achievement. The four least important needs were Authority, Independence, Activity, and Social Status. For 8th grade students, Social Status had the most variability (.99) and Working Conditions had the least variability (.58).

Ninth Grade. Mean MIQ scores for 9th grade students ranged from a low of -.09 on Authority to a high of +1.46 on Ability Utilization. The five most important needs for 9th grade students were Ability Utilization, Security, Achievement, and Advancement and Social Service (tied). The four least important needs were Authority, Independence, Activity, and Social Status. For 9th grade students, Variety had the most variability (.98) and Achievement had the least variability (.60).

Tenth Grade. Mean MIQ scores for 10th grade students ranged from a low of -.34 on Authority to a high of +1.42 on Ability Utilization. The four most important needs for 10th grade students were Ability Utilization, Achievement, Security, and Advancement. The four least important needs were Authority, Independence, Social Status, and Activity. Social Status had the most variability (.98) and Supervision-Technical had the least variability (.62).

Eleventh Grade. Mean MIQ scores for 11th grade students ranged from a low of -.32 on Authority to a high of +1.46 on Ability Utilization. The four most important needs for 11th grade students were Ability Utilization, Advancement, Achievement, and Security. The four least important needs were Authority, Independence, Social Status, and Activity. Social Status had the most variability (1.01), and Achievement had the least variability (.62).

Comparison Across Grade Groups. Across grade groups, the most important vocational need was Ability Utilization. However, differences occurred in the perceptions of the next highest ranked needs. For 8th grade students, Social Service was ranked second, while Advancement did not appear in the top four needs. For the 10th and 11th grade students, Social Service did not appear in the top four, while Advancement was rated fourth for the 10th grade and second for the 11th grade. Across all grades, both Security and Achievement appeared among the highest ranking needs. The least important needs were basically the same for all four grades: Authority, Independence, Social Status, and Activity. For three grade groups (8th, 10th, and 11th), Social Status had the most variability. For 9th grade students, Variety had the most variability. For 9th and 11th grade students, Achievement had the least variability. For 8th grade students, Working Conditions had the least variability, and for 10th grade students, Supervision-Technical had the least variability.

Sex-Within-Grade Groups

The data for each sex group within each grade are presented in Tables 5 through 8.

Eighth Grade Females. Mean MIQ scores for 8th grade females ranged from a low of -.13 on Authority to a high of +1.22 on Ability Utilization. The four most important needs were Ability Utilization, Social Service, Achievement, and Working Conditions. The three least important needs were Authority, Independence, and Activity. The vocational needs of Social Status and Supervision-Human Relations were tied for fourth place. Social Status had the most variability (.99) and Working Conditions had the least variability (.59). These data are presented in Table 5.

Eighth Grade Males. Mean MIQ scores for 8th grade males ranged from a low of -.04 on Authority to a high of +1.23 on Ability Utilization. The four most important needs were Ability Utilization, Security, Working Conditions, and Social Service. The four least important needs were Authority, Activity, Independence, and Social Status. Social Status had the most variability (.98) and Working Conditions had the least variability (.57). These data are presented in Table 5.

Ninth Grade Females. Mean MIQ scores for 9th grade females ranged from a low of -.21 on Authority to a high of +1.50 on Ability Utilization. The four most important needs were Ability Utilization, Social Service, Achievement, and Security. The three least important needs were Authority, Independence, and Activity. Social Status and Variety were tied for fourth place. Variety had the most variability (1.01) and Achievement had the least variability (.60). These data are presented in Table 6.

Table 5

MIQ Means and Standard Deviations for Eighth Grade Students, by Sex Group

MIQ Scale	Male (N=146)		Female (N=192)		Total (N=338)	
	Mean	SD	Mean	SD	Mean	SD
AU	1.23	0.69	1.22	0.69	1.22	0.69
Ach	1.01	0.60	1.10	0.66	1.06	0.63
Act	0.24	0.82	0.32	0.77	0.28	0.80
Adv	1.04	0.70	0.85	0.69	0.95	0.70
Aut	-0.04	0.90	-0.13	0.83	-0.09	0.87
CPP	0.62	0.70	0.57	0.69	0.60	0.70
Com	0.73	0.81	0.64	0.77	0.69	0.79
CoW	0.66	0.65	0.57	0.74	0.62	0.70
Cre	0.84	0.77	0.76	0.76	0.80	0.77
Ind	0.29	0.93	0.16	0.87	0.23	0.90
MV	0.68	0.88	0.85	0.89	0.77	0.89
Rec	0.87	0.70	0.74	0.74	0.81	0.72
Res	0.85	0.80	0.68	0.79	0.77	0.80
Sec	1.16	0.82	1.02	0.71	1.09	0.77
SSe	1.05	0.80	1.18	0.82	1.12	0.81
SSt	0.44	0.98	0.45	0.99	0.45	0.99
SHR	0.55	0.74	0.45	0.81	0.50	0.78
ST	0.63	0.68	0.57	0.80	0.60	0.74
Var	0.55	0.97	0.55	0.87	0.55	0.92
WC	1.08	0.57	1.03	0.59	1.05	0.58
TCT	127.10	65.70	128.80	65.50	128.00	65.60

Table 6

MIQ Means and Standard Deviations for Ninth Grade Students, by Sex Group

MIQ Scale	Male (N=148)		Female (N=150)		Total (N=298)	
	Mean	SD	Mean	SD	Mean	SD
AU	1.42	0.65	1.50	0.63	1.46	0.64
Ach	1.22	0.59	1.28	0.60	1.25	0.60
Act	0.27	0.81	0.33	0.84	0.30	0.83
Adv	1.28	0.71	1.11	0.68	1.20	0.70
Aut	-0.03	0.91	-0.21	0.84	-0.09	0.88
CPP	0.78	0.76	0.86	0.62	0.82	0.69
Com	0.72	0.79	0.64	0.84	0.68	0.82
CoW	0.77	0.70	0.79	0.75	0.78	0.73
Cre	0.90	0.78	0.87	0.78	0.89	0.78
Ind	0.19	0.86	0.09	0.86	0.14	0.86
MV	0.74	0.94	0.85	0.87	0.80	0.91
Rec	0.94	0.74	0.95	0.68	0.95	0.71
Res	0.90	0.75	0.71	0.81	0.81	0.78
Sec	1.30	0.81	1.27	0.83	1.29	0.82
SSe	1.02	0.87	1.37	0.85	1.20	0.86
SSt	0.29	0.97	0.44	0.91	0.37	0.94
SHR	0.68	0.78	0.55	0.67	0.62	0.73
ST	0.64	0.75	0.61	0.72	0.63	0.74
Var	0.44	0.95	0.44	1.01	0.44	0.98
WC	1.14	0.77	1.11	0.64	1.13	0.71
TCT	111.70	64.20	104.40	58.90	108.10	61.60

Ninth Grade Males. Mean MIQ scores for 9th grade males ranged from a low of -.03 on Authority to a high of +1.42 on Ability Utilization. The four most important needs were Ability Utilization, Security, Advancement, and Achievement. The four least important needs were Authority, Independence, Activity, and Social Status. Social Status had the most variability (.97) and Achievement had the least variability (.59). These data are presented in Table 6.

Tenth Grade Females. Mean MIQ scores for 10th grade females ranged from a low of -.50 on Authority to a high of +1.57 on Ability Utilization. The four most important needs were Ability Utilization, Social Service, Achievement, and Security. The four least important needs were Authority, Social Status, Independence, and Activity. Social Status had the most variability (1.02) and Company Policies and Practices had the least variability (.57). These data are presented in Table 7.

Tenth Grade Males. Mean MIQ scores for 10th grade males ranged from a low of -.18 on Authority to a high of +1.26 on Achievement and Ability Utilization. The four most important needs were Achievement, Ability Utilization, Advancement, and Security. The four least important needs were Authority, Independence, Activity, and Social Status. Social Status had the most variability (.94) and Working Conditions had the least variability (.58). These data are presented in Table 7.

Table 7

MIQ Means and Standard Deviations for Tenth Grade Students, by Sex Group

MIQ Scale	Male (N=231)		Female (N=265)		Total (N=496)	
	Mean	SD	Mean	SD	Mean	SD
AU	1.26	0.70	1.57	0.64	1.42	0.67
Ach	1.26	0.66	1.39	0.60	1.33	0.63
Act	0.09	0.79	0.30	0.71	0.20	0.75
Adv	1.15	0.73	1.16	0.73	1.16	0.73
Aut	-0.18	0.91	-0.50	0.74	-0.34	0.83
CPP	0.65	0.73	0.86	0.57	0.76	0.65
Com	0.71	0.81	0.54	0.81	0.63	0.81
CoW	0.67	0.62	0.68	0.66	0.68	0.64
Cre	0.70	0.90	0.87	0.73	0.79	0.82
Ind	0.05	0.86	0.09	0.80	0.07	0.83
MV	0.65	0.87	0.84	0.86	0.75	0.87
Rec	0.78	0.76	0.74	0.73	0.76	0.75
Res	0.79	0.81	0.72	0.79	0.76	0.80
Sec	1.12	0.69	1.29	0.66	1.21	0.68
SSe	0.77	0.88	1.45	0.79	1.11	0.84
SSt	0.16	0.94	0.07	1.02	0.12	0.98
SHR	0.47	0.66	0.58	0.64	0.53	0.65
ST	0.49	0.63	0.68	0.61	0.59	0.62
Var	0.35	0.87	0.42	0.89	0.39	0.88
WC	1.00	0.58	1.14	0.67	1.07	0.63
TCT	115.70	64.70	94.20	57.50	105.00	61.10

Eleventh Grade Females. Mean MIQ scores for 11th grade females ranged from a low of -.48 on Authority to a high of +1.51 on Ability Utilization. The four most important needs were Ability Utilization, Social Service, Advancement, and Achievement. The four least important needs were Authority, Independence, Social Status, and Activity. Social Status had the most variability (1.00) and Supervision-Technical had the least variability (.57). These data are presented in Table 8.

Eleventh Grade Males. Mean MIQ scores for 11th grade males ranged from a low of -.16 on Authority to a high of +1.41 on Ability Utilization. The four most important needs were Ability Utilization, Advancement, Security, and Achievement. The four least important needs were Authority, Independence, Activity, and Social Status. Social Status had the most variability (1.02) and Achievement had the least variability (.62). These data are presented in Table 8.

Comparison Across Sex Groups Within Grade Groups. An examination of the means for each sex group within each grade revealed several major differences. For 10th grade males, Ability Utilization and Achievement were ranked equally as the most important need. For all other grade levels, only Ability Utilization was ranked first. In addition, the females at every grade level ranked Social Service second, while the males at each grade level except 8th grade did not include Social Service among the four most important needs. The females obviously valued Social Service, while the males did not to the same extent.

Table 8

MIQ Means and Standard Deviations for Eleventh Grade Students, by Sex Group

MIQ Scale	Male (N=275)		Female (N=353)		Total (N=628)	
	Mean	SD	Mean	SD	Mean	SD
AU	1.41	0.63	1.51	0.64	1.46	0.64
Ach	1.25	0.62	1.38	0.61	1.32	0.62
Act	0.06	0.80	0.32	0.78	0.19	0.79
Adv	1.37	0.75	1.38	0.71	1.38	0.73
Aut	-0.16	0.82	-0.48	0.79	-0.32	0.8
CPP	0.74	0.73	0.92	0.62	0.83	0.68
Com	0.59	0.87	0.42	0.77	0.51	0.82
CoW	0.62	0.67	0.73	0.61	0.68	0.64
Cre	0.74	0.74	0.78	0.78	0.76	0.76
Ind	0.04	0.78	-0.06	0.82	-0.01	0.80
MV	0.62	0.94	0.88	0.92	0.75	0.93
Rec	0.91	0.74	0.81	0.71	0.86	0.73
Res	0.87	0.72	0.72	0.77	0.80	0.75
Sec	1.32	0.83	1.22	0.80	1.27	0.82
SSe	0.96	0.86	1.40	0.80	1.18	0.83
SSt	0.28	1.02	-0.04	1.00	0.12	1.01
SHR	0.69	0.82	0.69	0.67	0.69	0.75
ST	0.52	0.74	0.67	0.57	0.60	0.66
Var	0.40	0.88	0.51	0.84	0.46	0.86
WC	1.02	0.72	1.12	0.62	1.07	0.67
TCT	100.00	59.30	89.70	55.40	94.9	57.40

Basically, the same needs--Authority, Independence, Social Status, and Activity--were considered to be the least important by both males and females at each grade level.

For all groups except one, Social Status had the most variability. For 9th grade females, Variety had the most variability. Several differences appeared among the groups in terms of those scales with the least variability. For 9th grade males and females and 11th grade males, Achievement had the least variability. For 8th grade males and females and 10th grade males, Working Conditions had the least variability. For 10th grade females, Company Policies and Practices had the least variability, and for 11th grade females, Supervision-Technical had the least variability.

Hypothesis One: There are no significant differences in vocational needs between high school males and high school females.

Analysis of variance revealed statistically significant ($p \leq .05$) mean score differences between males and females on 12 of the 20 MIQ scales. These 12 scales were: Ability Utilization, Achievement, Activity, Authority, Company Policies and Practices, Compensation, Moral Values, Recognition, Responsibility, Social Service, Social Status, and Supervision-Technical. In addition, a significant mean score difference was found between males and females on the TCT scale.

The eight scales for which there were no statistically significant ($p \leq .05$) differences were: Advancement, Co-Workers, Creativity, Independence, Security, Supervision-Human Relations, Variety, and Working Conditions.

The summary of the analyses of variance are given in Table 9.

An examination of the scale means for the MIQ scores of males and females (see Table 3) revealed that females scored significantly higher than males on Ability Utilization, Achievement, Activity, Company Policies and Practices, Moral Values, Social Service, and Supervision-Technical. Only on the scales of Compensation, Recognition, Responsibility, Social Status, and Authority did the males score higher than the females.

An examination of the variance ratios comparing male and female scale score variability revealed that the largest variance ratios ($p \leq .01$) occurred for the scales of Company Policies and Practices and Authority. In the case of both needs, the male students demonstrated more variability among themselves as to the importance of the needs than did the females. These data are presented in Table 10.

The rank order of mean MIQ scale scores for both males and females is shown in Table 11. The relationship between the two rank orders was described by a Spearman rank correlation of +.92, indicating that there is a high agreement between the male and female groups in the relative importance which each group assigned to their vocational needs.

An examination of the rank order data revealed that males and females disagreed most on the relative importance of three scales. For males, Moral Values was ranked 13th out of a possible 20, whereas

Table 9

Summary of Two-Way Analyses of Variance of MIQ Scale Scores, by Scale

Scale/Source of Variation	df	Mean Square	F-ratio	p
Ability Utilization				
Sex	1	779.58	18.08	0.001*
Grade	3	495.22	11.49	0.001*
Sex by Grade	3	196.03	4.55	0.004*
Within	1752	43.12		
Achievement				
Sex	1	534.65	13.95	0.001*
Grade	3	611.36	15.95	0.001*
Sex by Grade	3	11.92	0.31	0.818
Within	1752	38.34		
Activity				
Sex	1	1375.62	22.31	0.001*
Grade	3	106.83	1.73	0.159
Sex by Grade	3	97.96	1.59	0.190
Within	1752	61.65		
Advancement				
Sex	1	163.79	3.19	0.074
Grade	3	1467.20	28.60	0.001*
Sex by Grade	3	117.87	2.30	0.076
Within	1752	51.30		
Authority				
Sex	1	3043.45	44.02	0.001*
Grade	3	869.71	12.58	0.001*
Sex by Grade	3	115.00	1.66	0.173
Within	1752	69.14		
Company Policies and Practices				
Sex	1	701.63	15.54	0.001*
Grade	3	504.22	11.17	0.001*
Sex by Grade	3	133.02	2.95	0.032*
Within	1752	45.16		

Table 9 (Continued)

Scale/Source of Variation	df	Mean Square	F-ratio	p
Compensation				
Sex	1	882.91	13.49	0.001*
Grade	3	350.92	7.56	0.001*
Sex by Grade	3	23.74	0.36	0.780
Within	1752	64.45		
Co-Workers				
Sex	1	26.12	0.59	0.442
Grade	3	156.52	3.55	0.014*
Sex by Grade	3	68.07	1.55	0.201
Within	1752	44.07		
Creativity				
Sex	1	71.92	1.18	0.280
Grade	3	102.16	1.68	0.170
Sex by Grade	3	123.97	2.04	0.107
Within	1752	60.82		
Independence				
Sex	1	174.81	2.49	0.115
Grade	3	435.84	6.20	0.001*
Sex by Grade	3	67.95	0.97	0.408
Within	1752	70.31		
Moral Values				
Sex	1	1615.24	19.98	0.001*
Grade	3	17.43	0.22	0.886
Sex by Grade	3	38.75	0.48	0.697
Within	1752	81.53		
Recognition				
Sex	1	212.28	4.05	0.044*
Grade	3	227.84	4.35	0.005*
Sex by Grade	3	33.54	0.64	0.589
Within	1752	52.74		
Responsibility				
Sex	1	885.98	14.69	0.001*
Grade	3	22.22	0.37	0.776
Sex by Grade	3	26.17	0.43	0.729
Within	1752	60.33		

Table 9 (Continued)

Scale/Source of Variation	df	Mean Square	F-ratio	p
Security				
Sex	1	17.22	0.29	0.588
Grade	3	304.08	5.18	0.001*
Sex by Grade	3	224.58	3.82	0.010*
Within	1752	58.73		
Social Service				
Sex	1	8189.57	118.81	0.001*
Grade	3	91.73	1.33	0.263
Sex by Grade	3	528.19	7.66	0.001*
Within	1752	74.36		
Social Status				
Sex	1	535.19	5.51	0.019*
Grade	3	1247.82	12.86	0.001*
Sex by Grade	3	417.46	4.30	0.005*
Within	1752	97.06		
Supervision-Human Relations				
Sex	1	3.82	0.07	0.786
Grade	3	380.55	7.33	0.001*
Sex by Grade	3	128.05	2.47	0.061
Within	1752	51.92		
Supervision-Technical				
Sex	1	360.86	7.90	0.005*
Grade	3	8.13	0.18	0.911
Sex by Grade	3	169.36	3.71	0.011*
Within	1752	45.70		
Variety				
Sex	1	166.35	2.07	0.150
Grade	3	169.91	2.12	0.096
Sex by Grade	3	38.21	0.48	0.699
Within	1750	80.24		
Working Conditions				
Sex	1	158.65	3.81	0.051
Grade	3	28.08	0.67	0.568
Sex by Grade	3	88.82	2.13	0.095
Within	1752	41.82		

Table 9 (Continued)

Scale/Source of Variation	df	Mean Square	F-ratio	p
TCT				
Sex	1	49626.96	13.48	0.001*
Grade	3	84823.45	23.04	0.001*
Sex by Grade	3	9242.58	2.51	0.057
Within	1752	3681.53		

* p $\leq$ .05

Table 10

MIQ Scale Score Variance for Males and Females and Variance Ratio for Each MIQ Scale

MIQ Scale	Variance		Variance Ratio
	Male (N = 800)	Female (N = 960)	
Ability Utilization	0.45	0.44	1.02
Achievement	0.40	0.38	1.05
Activity	0.66	0.59	1.12
Advancement	0.55	0.53	1.04
Authority	0.77	0.64	1.20*
Company Policies and Practices	0.53	0.40	1.33*
Compensation	0.69	0.64	1.08
Co-Workers	0.44	0.45	1.02
Creativity	0.64	0.58	1.10
Independence	0.67	0.69	1.03
Moral Values	0.83	0.79	1.05
Recognition	0.55	0.52	1.06
Responsibility	0.59	0.62	1.05
Security	0.62	0.58	1.07
Social Service	0.74	0.66	1.12
Social Status	0.96	1.02	1.06
Supervision-Human Relations	0.58	0.49	1.18
Supervision-Technical	0.49	0.44	1.11
Variety	0.83	0.79	1.05
Working Conditions	0.45	0.40	1.13
TCT	4044.00	3640.00	1.11

* $p \leq .01$.

Table 11

Rank Order of Mean MIQ Scale Scores for Male and Female Groups

MIQ Scale	Rank Order Male (N=800)	Rank Order Female (N=960)
Ability Utilization	1	1
Achievement	4	3
Activity	18	17
Advancement	2.5	5
Authority	20	20
Company Policies and Practices	10	8
Compensation	11	15
Co-Workers	12	12
Creativity	9	9
Independence	19	19
Moral Values	13	7
Recognition	7	10
Responsibility	8	11
Security	2.5	4
Social Service	6	2
Social Status	17	18
Supervision-Human Relations	14	14
Supervision-Technical	15	13
Variety	16	16
Working Conditions	5	6

Spearman Rank Order Correlation = +.92

for females, Moral Values was ranked 7th out of 20. Social Service was ranked 6th by males and 2nd by females. Compensation was ranked 11th by males and 15th by females.

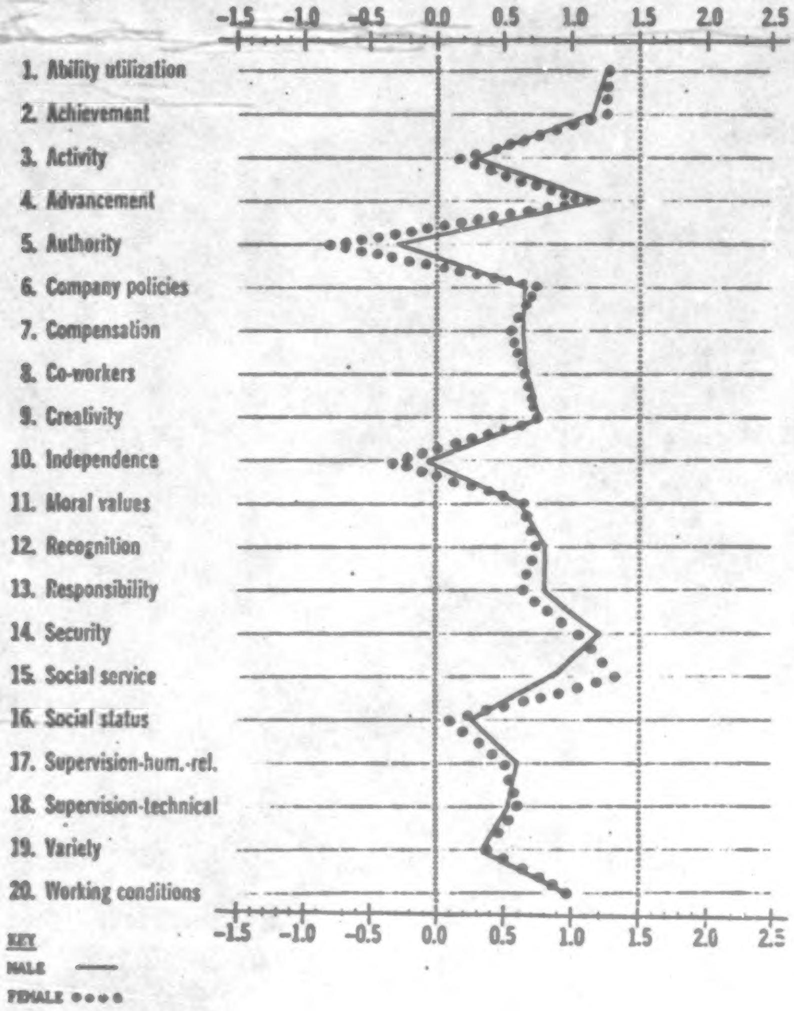
The ranks in Table 11 were assigned to the 20 needs on the basis of the mean MIQ scale scores. To eliminate the possibility that the ranks were unduly influenced by extreme scores, the median MIQ scale scores were calculated and plotted in Figure 1. An examination of these data revealed that the influence of extreme scores was negligible. As stated earlier, males and females differed only slightly in how they perceived the relative importance of vocational needs, with the largest differences occurring for Moral Values, Social Service, and Compensation. (Moral Values and Social Service were valued more strongly by females, while Compensation was valued more strongly by males.) As shown in Figure 1, the use of medians did not increase the differences between males and females.

Hypothesis Two: There are no significant differences in vocational needs among students in the 8th, 9th, 10th, and 11th grades.

Analysis of variance of the data revealed statistically significant ($p \leq .05$) differences among the mean MIQ scale scores of 8th, 9th, 10th, and 11th grade students for the MIQ scales of Ability Utilization, Achievement, Advancement, Authority, Company Policies and Practices, Compensation, Co-Workers, Independence, Recognition, Security, Social Status, and Supervision-Human Relations. Also,

Figure 1

Median MIQ Scale Scores for Male and Female Groups



significant mean differences among grades were observed on the TCT scores.

No statistically significant differences were found for the scales of Activity, Creativity, Moral Values, Responsibility, Social Service, Supervision-Technical, Variety, and Working Conditions.

A Scheffé Test was conducted to determine where the significant mean differences occurred for each of the MIQ scales. This analysis revealed that, except for the MIQ scales of Compensation, Recognition, Social Status, and TCT, the 8th grade students invariably had significantly lower means than the 9th, 10th, and 11th grade students. In addition, on the Advancement scale, the 11th grade students' mean was significantly higher than both the 9th and the 10th grade students' means. Otherwise, the 9th, 10th, and 11th grade students generally did not differ in their MIQ scale mean scores.

On the Independence scale, the 8th grade students' mean was significantly higher than that of the 11th grade students. On the Social Status scale, the 8th and 9th grade students' means were significantly higher than those of the 10th and 11th grade students.

The analysis of variance data on which these significant findings are based are reported in Table 9. The means and standard deviations on the MIQ scales for each grade level are presented in Table 4. The results of the Scheffé test are presented in Table 12.

Variance ratios for pairings of grade groups were calculated to examine differences in score variability among the grades. A variance

Table 12

Subsets of Non-differing MIQ Scale Means
as Determined by the Scheffé Procedure

MIQ Scale	Homogeneous Subsets of Grade Groups and Their Means		
	Subset One	Subset Two	Subset Three
Ability Utilization	Grade 8 (1.22)	Grade 9 (1.46)	
		Grade 10 (1.42)	
		Grade 11 (1.46)	
Achievement	Grade 8 (1.06)	Grade 9 (1.25)	
		Grade 10 (1.33)	
		Grade 11 (1.32)	
Activity	Grade 10 (0.20)		
	Grade 8 (0.28)		
	Grade 11 (0.19)		
	Grade 9 (0.30)		
Advancement	Grade 8 (0.95)	Grade 9 (1.20)	Grade 11(1.38)
		Grade 10 (1.16)	
Authority	Grade 10 (-0.34)	Grade 9 (-0.09)	
	Grade 11 (-0.32)	Grade 8 (-0.09)	
Company Policies and Practices	Grade 8 (0.60)	Grade 10 (0.76)	
		Grade 9 (0.82)	
		Grade 11 (0.83)	
Compensation	Grade 10 (0.63)	Grade 10 (0.63)	
	Grade 11 (0.51)	Grade 9 (0.68)	
		Grade 8 (0.69)	
Co-Workers	Grade 8 (0.62)	Grade 11 (0.68)	
	Grade 10 (0.68)	Grade 9 (0.78)	
	Grade 11 (0.68)	Grade 10 (0.68)	

Table 12 (Continued)

MIQ Scale	Homogeneous Subsets of Grade Groups and Their Means		
	Subset One	Subset Two	Subset Three
Creativity	Grade 8 (0.80)		
	Grade 9 (0.89)		
	Grade 11 (0.76)		
	Grade 10 (0.79)		
Independence	Grade 11 (-0.01)	Grade 10 (0.07)	
	Grade 10 (0.07)	Grade 9 (0.14)	
	Grade 9 (0.14)	Grade 8 (0.23)	
Moral Values	Grade 8 (0.77)		
	Grade 9 (0.80)		
	Grade 10 (0.75)		
	Grade 11 (0.75)		
Recognition	Grade 8 (0.81)	Grade 11 (0.86)	
	Grade 10 (0.76)	Grade 8 (0.81)	
	Grade 11 (0.86)	Grade 9 (0.95)	
Responsibility	Grade 8 (0.77)		
	Grade 9 (0.81)		
	Grade 10 (0.76)		
	Grade 11 (0.80)		
Security	Grade 8 (1.09)	Grade 9 (1.29)	
	Grade 10 (1.21)	Grade 11 (1.27)	
		Grade 10 (1.21)	
Social Service	Grade 8 (1.12)		
	Grade 9 (1.20)		
	Grade 10 (1.11)		
	Grade 11 (1.18)		
Social Status	Grade 11 (0.12)	Grade 8 (0.45)	
	Grade 10 (0.12)	Grade 9 (0.37)	

Table 12 (Continued)

MIQ Scale	Homogeneous Subsets of Grade Groups and Their Means		
	Subset One	Subset Two	Subset Three
Supervision-Human Relations	Grade 8 (0.50)	Grade 9 (0.62)	
	Grade 10 (0.53)	Grade 11 (0.69)	
	Grade 9 (0.62)		
Supervision-Technical	Grade 8 (0.60)		
	Grade 10 (0.59)		
	Grade 11 (0.60)		
	Grade 9 (0.63)		
Variety	Grade 8 (0.55)		
	Grade 10 (0.39)		
	Grade 9 (0.44)		
	Grade 11 (0.46)		
Working Conditions	Grade 8 (1.05)		
	Grade 9 (1.13)		
	Grade 11 (1.07)		
	Grade 10 (1.07)		

ratio of 1.20 ($p \leq .01$) was chosen as being both statistically and practically significant for inclusion in the discussion that follows:

Eighth Versus Ninth Grade. An examination of the variance ratios for the 8th and 9th grades revealed that the largest ratio ($p \leq .01$) occurred for Working Conditions. The 9th grade students demonstrated more variability in their evaluation of this need than did the 8th grade students. These data are presented in Table 13.

Eighth Versus Tenth Grade. An examination of the variance ratios for the 8th and 10th grades revealed that the largest ratios ($p \leq .01$) occurred for Co-Workers, Security, Supervision-Human Relations, and Supervision-Technical. In all cases, the 8th grade students demonstrated more variability than did the 10th grade students. These data are presented in Table 14.

Eighth Versus Eleventh Grade. For the 8th and 11th grades, the largest variance ratios ($p \leq .01$) were observed for Co-Workers, Independence, Supervision-Technical, Working Conditions, and TCT. The 11th grade students demonstrated more variability than did the 8th grade students on Working Conditions and TCT. The 8th grade students demonstrated more variability than did the 11th grade students on Co-Workers, Independence, and Supervision-Technical. These data are presented in Table 15.

Ninth Versus Tenth Grade. For the 9th and 10th grades, sufficiently large variance ratios ($p \leq .01$) were observed for Activity, Co-Workers, Supervision-Human Relations, Variety, Security, and Supervision-Technical. In the case of these needs, the 9th grade

Table 13

MIQ Scale Score Variance for Eighth and Ninth Grade Groups and Variance Ratio for Each MIQ Scale

MIQ Scale	Variance Eighth Grade (N = 338)	Variance Ninth Grade (N = 298)	Variance Ratio
Ability Utilization	0.48	0.41	1.17
Achievement	0.40	0.36	1.11
Activity	0.64	0.69	1.08
Advancement	0.49	0.49	1.00
Authority	0.76	0.77	1.01
Company Policies and Practices	0.49	0.48	1.02
Compensation	0.62	0.67	1.08
Co-Workers	0.49	0.53	1.08
Creativity	0.59	0.61	1.03
Independence	0.81	0.74	1.10
Moral Values	0.79	0.83	1.05
Recognition	0.52	0.50	1.04
Responsibility	0.64	0.61	1.05
Security	0.59	0.67	1.14
Social Service	0.66	0.74	1.12
Social Status	0.98	0.88	1.11
Supervision-Human Relations	0.61	0.53	1.15
Supervision-Technical	0.55	0.55	1.00
Variety	0.85	0.96	1.13
Working Conditions	0.34	0.50	1.47*
TCT	4303.00	3795.00	1.13

* $p \leq .01$

Table 14

MIQ Scale Score Variance for Eighth and Tenth Grade Groups and Variance Ratio for Each MIQ Scale

MIQ Scale	Variance Eighth Grade (N = 338)	Variance Tenth Grade (N = 496)	Variance Ratio
Ability Utilization	0.48	0.45	1.07
Achievement	0.40	0.40	1.00
Activity	0.64	0.56	1.14
Advancement	0.49	0.53	1.08
Authority	0.76	0.69	1.10
Company Policies and Practices	0.49	0.42	1.17
Compensation	0.62	0.66	1.06
Co-Workers	0.49	0.41	1.20*
Creativity	0.59	0.67	1.14
Independence	0.81	0.69	1.17
Moral Values	0.79	0.76	1.04
Recognition	0.52	0.56	1.08
Responsibility	0.64	0.64	1.00
Security	0.59	0.46	1.28*
Social Service	0.66	0.71	1.08
Social Status	0.98	0.96	1.02
Supervision-Human Relations	0.61	0.42	1.45*
Supervision-Technical	0.55	0.38	1.45*
Variety	0.85	0.77	1.10
Working Conditions	0.34	0.40	1.18
TCT	4303.00	3733.00	1.15

* $p \leq .01$

Table 15

MIQ Scale Score Variance for Eighth and Eleventh Grade Groups and Variance Ratio for Each MIQ Scale

MIQ Scale	Variance Eighth Grade (N = 338)	Variance Eleventh Grade (N = 628)	Variance Ratio
Ability Utilization	0.48	0.41	1.17
Achievement	0.40	0.38	1.05
Activity	0.64	0.62	1.03
Advancement	0.49	0.53	1.08
Authority	0.76	0.66	1.15
Company Policies and Practices	0.49	0.46	1.07
Compensation	0.62	0.67	1.08
Co-Workers	0.49	0.41	1.20*
Creativity	0.59	0.58	1.02
Independence	0.81	0.64	1.27*
Moral Values	0.79	0.87	1.10
Recognition	0.52	0.53	1.02
Responsibility	0.64	0.56	1.14
Security	0.59	0.67	1.14
Social Service	0.66	0.69	1.05
Social Status	0.98	1.02	1.04
Supervision-Human Relations	0.61	0.56	1.09
Supervision-Technical	0.55	0.44	1.25*
Variety	0.85	0.74	1.15
Working Conditions	0.34	0.45	1.32*
TCT	4303.00	3295.00	1.31*

* $p \leq .01$

students varied more among themselves than did the 10th grade students. These data are presented in Table 16.

Ninth Versus Eleventh Grade. For the 9th and 11th grade students, Co-Workers, Supervision-Technical, and Variety had sufficiently large variance ratios ($p \leq .01$). On this need, the 9th grade students demonstrated more variability than did the 11th grade students. These data are presented in Table 17.

Tenth Versus Eleventh Grade. For the 10th and 11th grades, sufficiently large variance ratios ($p \leq .01$) occurred for Security and Supervision-Human Relations. In both cases, the 11th grade demonstrated more variability than did the 10th grade. These data are presented in Table 18.

As in the sex group analysis, the mean MIQ scale scores were rank ordered for various grade pairs, as shown in Table 19. An analysis of these data revealed great similarities in the rank ordering of needs for students in the 8th, 9th, 10th, and 11th grades. The Spearman correlation coefficients are shown in Table 20. As expected, the correlation indices describing the relationship between adjacent grades were slightly higher than those describing the relationship between grades that were not adjacent. These data are shown in Table 20.

An examination of the actual ranks in Table 19 revealed some differences across grades. One of these was for Company Policies and Practices. The rankings for this scale ranged from 13.5th for 8th grade students to 8th for the 11th grade students. Apparently,

Table 16

MIQ Scale Score Variance for Ninth and Tenth Grade Groups and Variance Ratio for Each MIQ Scale

MIQ Scale	Variance		Variance Ratio
	Ninth Grade (N = 298)	Tenth Grade (N = 496)	
Ability Utilization	0.41	0.45	1.10
Achievement	0.36	0.40	1.11
Activity	0.69	0.56	1.23*
Advancement	0.49	0.53	1.08
Authority	0.77	0.69	1.12
Company Policies and Practices	0.48	0.42	1.14
Compensation	0.67	0.66	1.02
Co-Workers	0.53	0.41	1.29*
Creativity	0.61	0.67	1.10
Independence	0.74	0.69	1.07
Moral Values	0.83	0.76	1.09
Recognition	0.50	0.56	1.12
Responsibility	0.61	0.64	1.05
Security	0.67	0.46	1.46*
Social Service	0.74	0.71	1.04
Social Status	0.88	0.96	1.09
Supervision-Human Relations	0.53	0.42	1.26*
Supervision-Technical	0.55	0.38	1.45*
Variety	0.96	0.77	1.25*
Working Conditions	0.50	0.40	1.25*
TCT	3795.00	3733.00	1.02

* $p \leq .01$

Table 17

MIQ Scale Score Variance for Ninth and Eleventh Grade Groups and Variance Ratio for Each MIQ Scale

MIQ Scale	Variance		Variance Ratio
	Ninth Grade (N = 298)	Eleventh Grade (N = 628)	
Ability Utilization	0.41	0.41	1.00
Achievement	0.36	0.38	1.06
Activity	0.69	0.62	1.11
Advancement	0.49	0.53	1.08
Authority	0.77	0.66	1.17
Company Policies and Practices	0.48	0.46	1.04
Compensation	0.67	0.67	1.00
Co-Workers	0.53	0.41	1.29*
Creativity	0.61	0.58	1.05
Independence	0.74	0.64	1.16
Moral Values	0.83	0.87	1.05
Recognition	0.50	0.53	1.06
Responsibility	0.61	0.56	1.09
Security	0.67	0.67	1.00
Social Service	0.74	0.69	1.07
Social Status	0.88	1.02	1.16
Supervision-Human Relations	0.53	0.56	1.06
Supervision-Technical	0.55	0.44	1.25*
Variety	0.96	0.74	1.77*
Working Conditions	0.50	0.45	1.11
TCT	3795.00	3295.00	1.15

* $p \leq .01$

Table 18

MIQ Scale Score Variance for Tenth and Eleventh Grade Groups and Variance Ratio for Each MIQ Scale

MIQ Scale	Variance Tenth Grade (M = 496)	Variance Eleventh Grade (N = 628)	Variance Ratio
Ability Utilization	0.45	0.41	0.10
Achievement	0.40	0.38	1.05
Activity	0.56	0.62	1.11
Advancement	0.53	0.53	1.00
Authority	0.69	0.66	1.05
Company Policies and Practices	0.42	0.46	1.10
Compensation	0.66	0.67	1.02
Co-Workers	0.41	0.41	1.00
Creativity	0.67	0.58	1.16
Independence	0.69	0.64	1.08
Moral Values	0.76	0.87	1.15
Recognition	0.56	0.53	1.06
Responsibility	0.64	0.56	1.14
Security	0.46	0.67	1.46*
Social Service	0.71	0.69	1.03
Social Status	0.96	1.02	1.06
Supervision-Human Relations	0.42	0.56	1.33*
Supervision-Technical	0.38	0.44	1.16
Variety	0.77	0.74	1.04
Working Conditions	0.40	0.45	1.13
TCT	3733.00	3295.00	1.13

* $p \leq .01$

Table 19

Rank Order of Mean MIQ Scale Scores for Eighth, Ninth, Tenth, and Eleventh Grade Groups

MIQ Scale	Rank Order			
	Eighth (N=338)	Ninth (N=228)	Tenth (N=496)	Eleventh (N=628)
Ability Utilization	1	1	1	1
Achievement	4	3	2	3
Activity	18	18	17	17
Advancement	6	4.5	4	2
Authority	20	20	20	20
Company Policies and Practices	13.5	9	9	8
Compensation	11	13	13	15
Co-Workers	12	12	12	13
Creativity	8	8	7	10
Independence	19	19	19	19
Moral Values	9.5	11	11	11
Recognition	7	7	9	7
Responsibility	9.5	10	9	9
Security	3	2	3	4
Social Service	2	4.5	5	5
Social Status	17	17	18	18
Supervision-Human Relations	16	15	15	12
Supervision-Technical	13.5	14	14	14
Variety	15	16	16	16
Working Conditions	5	6	6	6

Table 20

Spearman Rank Correlations Between the Rankings of Mean MIQ Scale Scores, by Grade Pairing

Grade Pairing	Spearman Rank Correlation
Eighth and Ninth	+0.97
Eighth and Tenth	+0.96
Eighth and Eleventh	+0.92
Ninth and Tenth	+0.99
Ninth and Eleventh	+0.98
Tenth and Eleventh	+0.97

Company Policies and Practices is a more important need for older students. Also, as noted earlier, Social Service was ranked higher (second) by the 8th grade students than by the students in other grades.

The assignment of ranks in Table 19 was based on the means of the MIQ scores. To ascertain the degree to which extreme scores may have influenced these results, the medians for all scales for each grade level were calculated and plotted in Figure 2. An examination of these data revealed no discernible influence by extreme scores. The perceptions of the students in the 8th, 9th, 10th, and 11th grades were highly similar in regard to the relative importance of the twenty vocational needs measured by the MIQ.

Hypothesis Three: There are no significant differences between males and females in the 8th, 9th, 10th, and 11th grades in their rankings of vocational needs.

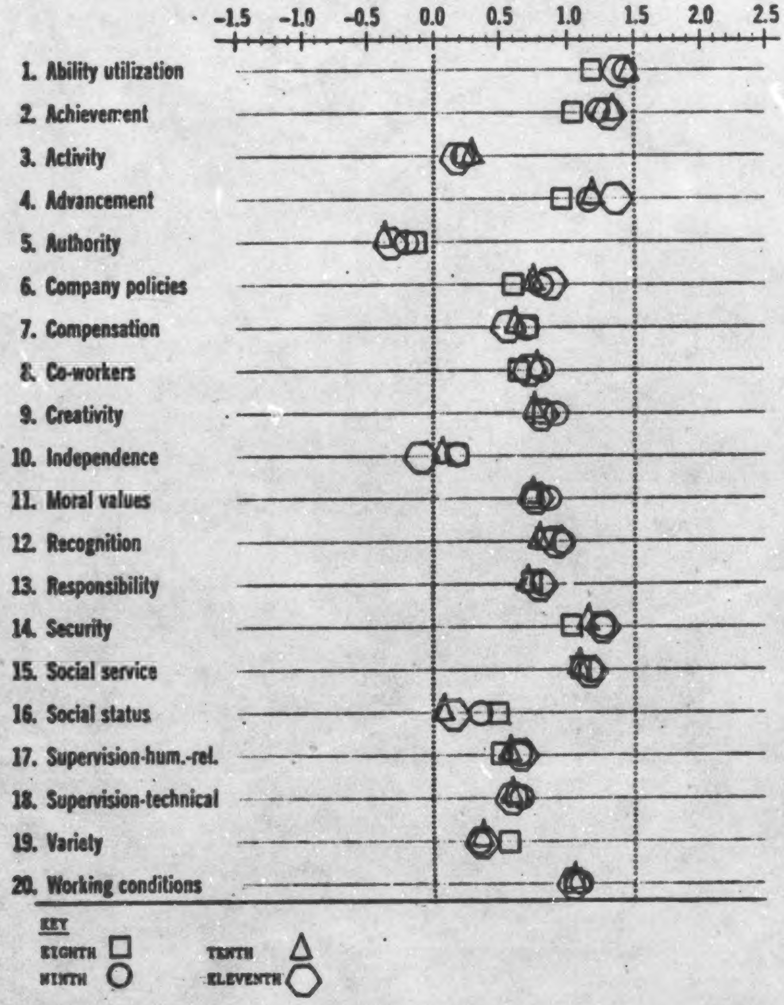
As in previous analyses, ranks were assigned to mean MIQ scale scores for male and female groups within each grade level. The rankings are shown in Tables 21 through 24.

The analysis of the data revealed that the rankings of males and females at each grade level were very similar. The Spearman rank correlations ranged between +.89 for the 10th grade and +.96 for the 9th grade.

The specific results are discussed on the following pages separately for each grade level.

Figure 2

Median MIQ Scale Scores for the
Eighth, Ninth, Tenth, and Eleventh Grade Groups



Eighth Grade. The Spearman rank correlation between the rankings of 8th grade males and females is +.95, indicating a high similarity in the relative importance assigned to the MIQ needs by the 8th grade males and females. These two groups differed somewhat in the importance attached to Moral Values, which was considered more important by females (rank of 6.5) and less important by males (rank of 10). These data are shown in Table 21.

To ascertain the degree to which these results might have been influenced by extreme scores, median MIQ scores for 8th grade males and females were calculated and plotted in Figure 3. An examination of the data revealed no discernible influences.

Ninth Grade. The 9th grade males and females were also similar in their perceptions of the relative importance of the MIQ vocational needs, as indicated by a Spearman rank correlation of +.96. Table 22 shows the rankings. No rankings were found to be markedly dissimilar.

To ascertain the effects of extreme scores, the median MIQ scale scores for males and females were calculated and plotted in Figure 4. No discernible influences were found.

Tenth Grade. The 10th grade males and females differed only slightly in their perceptions of the relative importance of the MIQ vocational needs, as demonstrated by a Spearman rank correlation of +.89. These rankings are shown in Table 23. The needs about which

Table 21

Rank Order of Mean MIQ Scale Scores
for Eighth Grade Male and Female Groups

MIQ Scale	Rank Order Male (N=146)	 Female (N=192)
Ability Utilization	1	1
Achievement	6	3
Activity	19	18
Advancement	5	6.5
Authority	20	20
Company Policies and Practices	14	13
Compensation	10	11
Co-Workers	12	13
Creativity	9	8
Independence	18	19
Moral Values	11	6.5
Recognition	7	9
Responsibility	8	10
Security	2	5
Social Service	4	2
Social Status	17	16.5
Supervision-Human Relations	15.5	16.5
Supervision-Technical	13	13
Variety	15.5	15
Working Conditions	3	4

Spearman Rank Order Correlation = +0.95

Figure 3

Median MIQ Scale Scores for Eighth Grade Male and Female Groups

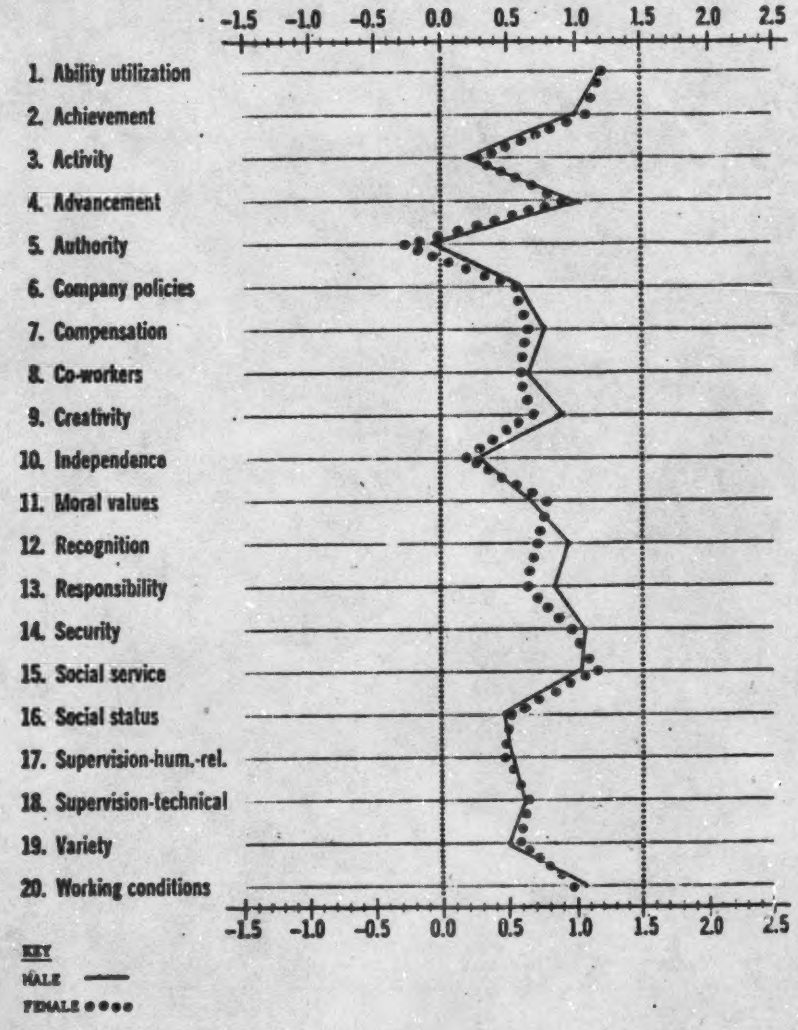


Table 22

Rank Order of Mean MIQ Scale Scores
for Ninth Grade Male and Female Groups

MIQ Scale	Rank Order Male (N=148)	Rank Order Female (N=150)
Ability Utilization	1	1
Achievement	4	3
Activity	18	18
Advancement	3	5.5
Authority	20	20
Company Policies and Practices	10	9
Compensation	13	13
Co-Workers	11	11
Creativity	8.5	8
Independence	19	19
Moral Values	12	10
Recognition	7	7
Responsibility	8.5	12
Security	2	4
Social Service	6	2
Social Status	17	16.5
Supervision-Human Relations	14	15
Supervision-Technical	15	14
Variety	16	16.5
Working Conditions	5	5.5

Spearman Rank Order Correlation = +.96

Figure 4

Median MIQ Scale Scores for Ninth Grade Male and Female Groups

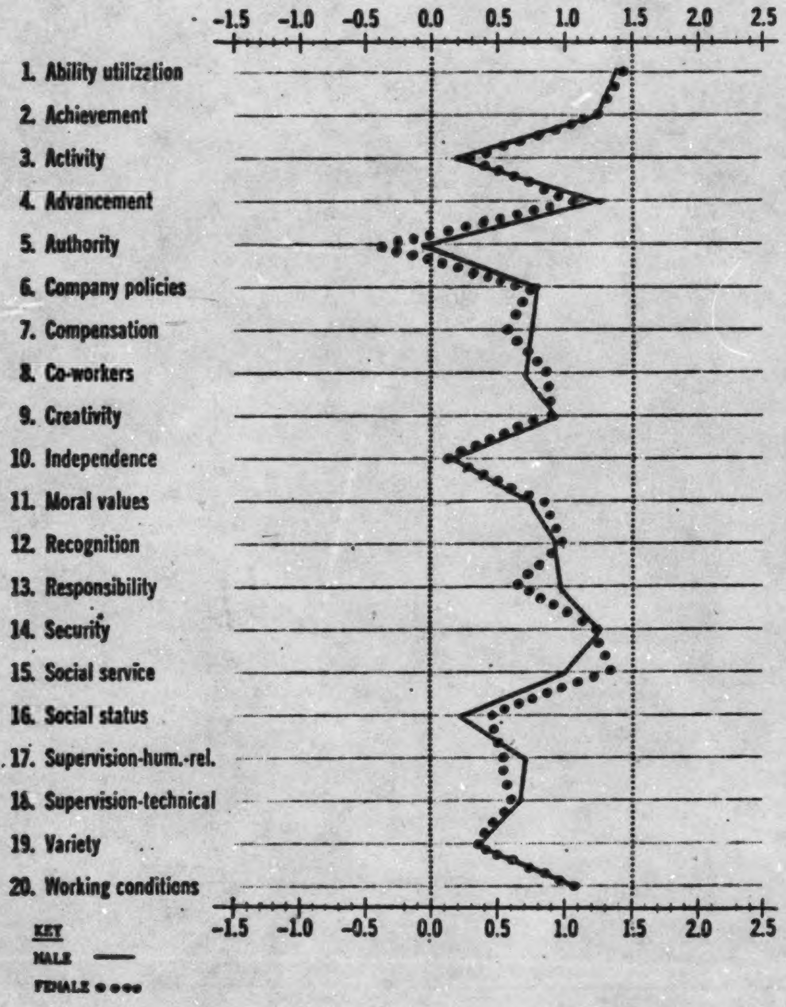


Table 23

Rank Order of Mean MIQ Scale Scores for Tenth Grade Male and Female Groups

MIQ Scale	Rank Order Male (N=231)	 Female (N=265)
Ability Utilization	1.5	1
Achievement	1.5	3
Activity	18	17
Advancement	3	5
Authority	20	20
Company Policies and Practices	12.5	8
Compensation	9	15
Co-Workers	11	12.5
Creativity	10	7
Independence	19	18
Moral Values	12.5	9
Recognition	7	10
Responsibility	6	11
Security	4	4
Social Service	8	2
Social Status	17	19
Supervision-Human Relations	15	14
Supervision-Technical	14	12.5
Variety	16	16
Working Conditions	5	6

Spearman Rank Order Correlation = +.89

the 10th grade males and females disagreed most were Company Policies and Practices, Compensation, Responsibility, and Social Service. Company Policies and Practices received a rank of 8 out of a possible 20 for the females, compared with a rank of 12.5 for the males. Females considered Compensation to be less important (rank of 15) than did males (rank of 9). Responsibility was ranked 11th by females and 6th by males. The greatest difference occurred for Social Service, which was ranked 2nd by females and 8th by males. It should also be noted that Ability Utilization was ranked equally with Achievement by the 10th grade males, who were the only group not ranking Ability Utilization above all others.

To ascertain the influence of extreme scores, the medians of the MIQ scale scores were calculated and plotted in Figure 5. An examination of these data revealed one change. For 10th grade males, Ability Utilization became the highest ranked need, and Achievement became the second ranked. No other changes were discernible.

Eleventh Grade. The 11th grade males and females were similar in their perceptions of the relative importance of the MIQ vocational needs, as indicated by a Spearman rank correlation of +0.94. An examination of the ranks in Table 24 revealed only one notable difference between ranks. Social Service was considered more important by females and less important by males.

To ascertain the influence of extreme scores, the medians of the MIQ scores were calculated and plotted in Figure 6. An examination of these data revealed two changes. For 11th grade females, Social

Figure 5

Median MIQ Scale Scores for Tenth Grade Male and Female Groups

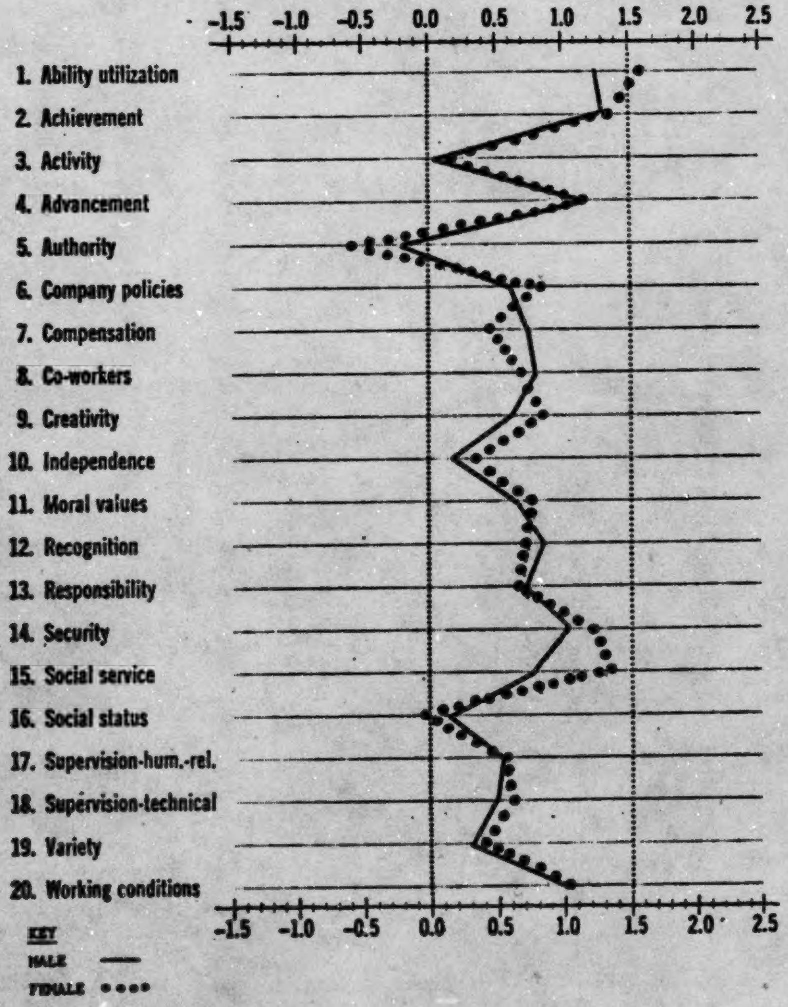


Table 24

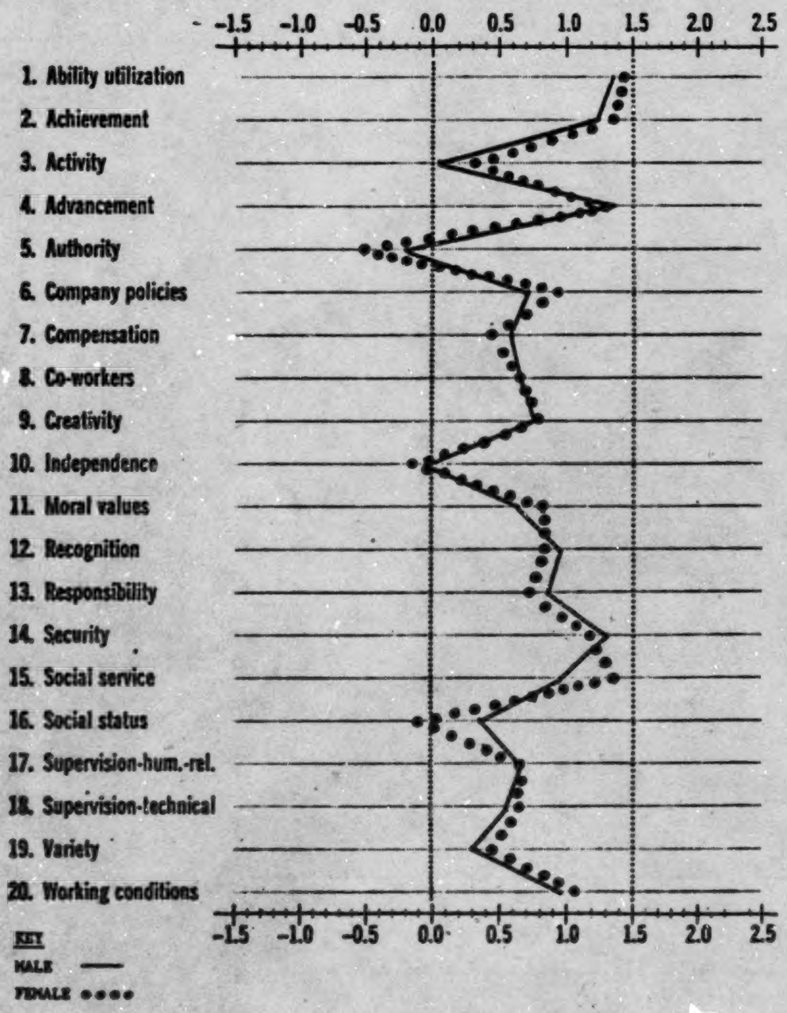
Rank Order of Mean MIQ Scale Scores for Eleventh Grade Male and Female Groups

MIQ Scale	Rank Order Male (N=275)	 Female (N=353)
Ability Utilization	1	1
Achievement	4	3.5
Activity	18	17
Advancement	2	3.5
Authority	20	20
Company Policies and Practices	9.5	7
Compensation	14	16
Co-Workers	12.5	11
Creativity	9.5	10
Independence	19	19
Moral Values	12.5	8
Recognition	7	9
Responsibility	8	12
Security	3	5
Social Service	6	2
Social Status	17	18
Supervision-Human Relations	11	13
Supervision-Technical	15	14
Variety	16	15
Working Conditions	5	6

Spearman Rank Order Correlation = +.94

Figure 6

Median MIQ Scale Scores for Eleventh Grade Male and Female Groups



Service was ranked 1st instead of 2nd, and Ability Utilization was ranked 3rd instead of 1st.

Hypothesis Four: There are no significant interaction effects between sex and grade.

The data bearing on this hypothesis are given in Table 9. The analysis of variance revealed that significant interactions ($p \leq .05$) between grade and sex occurred for six of the 20 MIQ scales: Ability Utilization, Company Policies and Practices, Security, Social Service, Social Status, and Supervision-Technical. For Ability Utilization, the highest mean among the male groups was for the 11th grade. For the female groups, it was for the 10th grade. The lowest scores for both sex groups were observed for the 8th grade. For Company Policies and Practices, the highest mean among the male groups was for the 9th grade. For female groups it was for the 9th and 10th grades. The lowest means for both sex groups were observed for the 8th grade. For Security, the highest mean among the male groups occurred for the 8th and 9th grades. For female groups, it occurred for the 9th and 10th grades. The lowest means for the female groups occurred for the 8th and 11th grades, and the lowest means for the males occurred for the 9th grade. For Social Service, the highest means were for the 9th grade (for males) and 10th grade (for females), while the lowest means were for the 10th grade (for females) and 8th grade (for males). For Social Status, 8th grade males and 8th and 9th grade females had the highest means. The lowest Social Status means were for 10th grade males and 11th grade females. For Supervision-Technical, the highest mean among the male groups occurred for the 8th grade, and the highest mean among the female groups occurred for the 10th grade. The lowest means occurred for the 9th and 11th grade males and the 9th and 11th grade females.

Question Two: What are the life history correlates of vocational needs of high school students?

The following discussion responds to the second question of this study. The final two hypotheses are discussed separately.

Hypothesis Five: There are systematic relationships between developmental life history factors and vocational needs.

Given 274 correlations between all SIB items and each MIQ scale score, 14 significant correlations would be expected by chance at the .05 level of significance and three significant correlations at the .01 level of significance. Since the N was large (N = 1,760), only correlations at $p \leq .001$ were taken as being of any practical significance. This includes all correlations larger than $r = .07$ ($r^2 = .005$).

The analysis of the data revealed more than three significant item correlations for 16 of the 20 MIQ scales and 14 or more significant correlations for 10 of the 20 MIQ scales. Correlations with the TCT score were significant for 92 items. These data are presented in Table 25.

Following is a specific discussion of the significant life history correlates of the MIQ scale scores and a comparison with Meresman's

Table 25

Number of Significant ($p \leq .001$) Correlations Between SIB Items and MIQ Scales

MIQ Scale	Number of Significant ($p \leq .001$) Correlations
Ability Utilization	8
Achievement	17
Activity	21
Advancement	16
Authority	29
Company Policies and Practices	4
Compensation	8
Co-Workers	4
Creativity	20
Independence	16
Moral Values	14
Recognition	2
Responsibility	19
Security	12
Social Service	18
Social Status	20
Supervision-Human Relations	1
Supervision-Technical	2
Variety	2
Working Conditions	10
TCT	91

(1975) findings for his Biographical Information (BI) items.

Ability Utilization

Eight SIB items were significantly correlated ($p \leq .001$) with the MIQ scale of Ability Utilization. The direction of the significant correlations was psychologically meaningful, indicating that students high on Ability Utilization: never get behind on school assignments (item 080); have normal use of both their hands (item 248); discuss after-school plans with their mothers, brothers, or sisters (items 122 and 123); feel that their teachers never criticize them for sloppy work (item 076); keep up to date with their assignments (item 087); and rarely read comic books (item 062). Only one of the items, item 002, seemed to be inconsistent. Students for whom it is important that their abilities be utilized rarely join school subject matter clubs, such as math, science, and foreign language clubs. It may be speculated that the national trend in the unpopularity of student club affiliation that was characteristic of schools throughout the nation during the late 60s and early 70s may have influenced the group of students who were high on Ability Utilization.

Table 26 shows the significant SIB correlates of Ability Utilization.

Meresman (1975) reported 11 BI items as significantly related to Ability Utilization. Surprisingly, none of Meresman's findings were supported in this study even though SIB items similar to his significant BI items could be readily identified.

Table 26

Significant (p ≤ .001) Correlations Between the SIB Items and the MIQ Ability Utilization Scale

SIB Item Number	Descriptive Statement	r
080	Gets behind in assignments	0.10
248	Normal use of both hands	-0.10
122	Discusses after-school plans with mother	0.09
123	Discusses after-school plans with brothers or sisters	0.09
062	Number of comic books read	-0.08
076	Teachers criticize for sloppy assignments	0.08
087	Keeps up to date on school assignments	-0.08
002	School subject matter clubs	0.08

Achievement

The data in this study indicate that the life history correlates of the Achievement need are similar to those for Ability Utilization; however, nine more correlates were found to be significant for Achievement. This similarity was expected for two reasons: (a) Gay et al. (1971) reported that a high correlation existed between the MIQ needs of Ability Utilization and Achievement; and (b) Meresman (1975) reported similar relationships between BI items and the MIQ Ability Utilization and Achievement scales.

Like the high Ability Utilization students in this study, the high Achievement students also discuss their after-school plans with family members, such as their mothers (item 122) and their fathers (item 121); never get behind on homework assignments (item 080); and keep their assignments up to date (item 087). Some differences were observed, however. For example, as Meresman (1975) found, high Achievement students seemed to come from more affluent families, as indicated by the following significant correlates: they have experienced fewer family moves and, therefore, have not had to cope with the disruptions caused by moving (item 168); they have many electrical appliances in their homes (item 189) and do not feel that they have as many skin problems as other students their age (item 013). (It has been speculated that few skin problems are the result of good diets.) Students high on Achievement rarely work in sales (item 043); rarely work in retail stores (item 042); and rarely have metal working hobbies (item 021). Students high on Achievement also indicated that they rarely built models (airplanes, ships, cars) in the last three years (item 016); do not regularly purchase or subscribe to science fiction magazines (item 185); have mothers with less than a high school education (item 215); live at home with both parents (item MAPA); are in college preparatory programs (item COLPREP) or business education programs (item BUSNS); and have at least one parent working in a large company (item LGCOM). These correlates seem to reflect the middle class orientation referred to by Starks (1967). (However, in his study biographical data were used to predict achievement as measured by course grades rather than Achievement need as measured by the importance of "a feeling of accomplishment.")

Table 27 shows the significant correlates of Achievement.

Activity

Meresman (1975) found only one significant BI item for the Activity need, which incidentally was not supported in this study: that students high on Activity tended to report that they designed or tailored clothes in their high school years. The only hobby to be significantly related to Activity in the present study was cooking (item 025).

However, 20 other correlates for Activity were found in these data. One correlate in particular--slow reading holds me back in school (item 082)--is especially interesting because it was three to six times higher than any other SIB-MIQ correlation at -0.69. This

Table 27

Significant ($p \leq .001$) Correlations Between the SIB Items and the MIQ Achievement Scale

SIB Item Number	Descriptive Statement	r
215	Mother's educational level	0.10
189	Electrical appliances in home	0.10
122	Discusses after-school plans with mother	0.09
013	Has more trouble with skin than others	0.09
016	Building models	-0.09
185	Science fiction magazines in home	0.09
168	Number of different residences	-0.09
080	Gets behind in assignments	0.08
121	Discusses after-school plans with father	0.08
087	Keeps up-to-date on assignments	-0.08
043	Sales work	0.08
042	Retail store work, stock work, delivery, etc.	0.08
021	Metal working	0.08
MAPA	Lives at home with both parents	0.07
COLPREP	Is in a college preparatory program	0.07
BUSNS	Is in a business education program	-0.07
LGCOM	Has one parent working for a large company	0.07

decisive correlate was psychologically consistent with several others. For example, students high on Activity report that: being a fast reader does not help them complete assignments (item 066), they accomplish little compared to the time they spend studying (item 069); they receive lower history and social studies grades (item 108); they receive low English grades (item 109); they complete fewer semesters of rigorous course work such as science (item 097) and mathematics (item 103); their overall school grades are low (item 112); they have at least one parent employed as a clerical or sales person (item CLRSAL) or as a farm owner or worker (item FARM) or as a professional/technical person (PROTEC); and they are enrolled in a business education program (item BUSNS). These correlations seem to indicate a possible subgroup of students who need to be busy all the time, but whose activities interfere with academic pursuits. The significant correlation between receiving good science grades (item 106) and high Activity indicates a second possible subgroup of students who need to be busy all the time, but whose activities are consistent with scholarship.

High Activity students also reported having mothers with higher levels of educational achievement (item 215) and being shorter than other students (item 223).

The data further indicate that students high on Activity tend to hold more regular part-time jobs for which they are paid (item 035), which conforms to a clinical hunch that people high on this need would have a rich history of activities that allowed them to keep busy all the time.

Table 28 shows the significant correlates of Activity.

Weiss et al. (1964) reported a low-reinforcement group for Activity to include general office clerks, laborers, truck drivers, and warehouse men. This evidence was partially supported by the high Activity students in this study who reported that they rarely held clerical jobs (item 038) and rarely held farm jobs (item 039).

Advancement

In this study, 16 SIB items were significantly related to the need Advancement, while Meresman (1975) reported five related BI items. The SIB and the BI correlates were, however, not related in any way.

The data in this study showed that Advancement was high for students who reported that they: have many electrical appliances in their homes (item 189); have the normal use of both their hands (item 248); and live in the same community most of their lives (item 166).

The findings conform to a clinical hunch that people high on this need would have a history of wanting opportunities for advancement. Students high on Advancement frequently discuss their college plans with teachers and principals (item 113) and counselors (item 117); frequently discuss their school work with school counselors (items 119); and complete many English courses (item 100). These correlates indicate that these students are striving for Advancement. They also reported that they read few books (item 055); do not join subject

Table 28

Significant ($p \leq .001$) Correlations Between the SIB Items and the MIQ Activity Scale

SIB Item Number	Descriptive Statement	r
082	Slow reading holds me back	-0.69
069	Accomplishes very little compared to time spent	-0.14
223	Respondent's height	-0.14
108	Grades in history and social studies	0.12
098	Number of foreign language courses	-0.11
109	Grades in English courses	0.11
097	Number of science courses	-0.11
106	Grades in science courses	-0.11
103	Number of math courses	-0.11
035	Number of summers worked for pay	0.11
VOC	Is in a vocational education program	0.11
215	Mother's educational level	0.10
PROTEC	Has one parent employed as a professional or technical person	-0.10
066	Is a fast reader	-0.09
112	Grades in all courses	0.09
038	Clerical work	0.08
039	Farm or orchard work	0.08
025	Cooking	-0.08

Table 28 (Continued)

SIB Item Number	Descriptive Statement	r
CLRSAL	Has one parent employed as a clerical/sales person	-0.08
BUSNS	Is enrolled in a business education program	0.07
FARM	Has one parent employed as a farm worker	0.07

matter clubs (item 002); and rarely have hobbies such as drawing, painting, graphic arts, and sculptoring (item 013) or photography (item 004). In those times, students in general were not avid readers or club joiners, so it is speculated that items 055 and 002 are not necessarily psychologically inconsistent with the picture of these students created by the other correlates. In addition, these students reported living in the same area all their lives (item HERE); coming from broken homes (item BROKEN); and having at least one parent employed as a workman or laborer (item LABOR).

The findings of the present study do not support the findings of the Meresman (1975) study.

Table 29 shows the significant correlates of Advancement.

Authority

In contrast with Meresman's study (1975), which found no BI item significantly related to Authority, 29 significant correlates were identified. Students high on Authority reported that they regularly purchase or receive in their homes the following magazines: business (item 182); science fiction (item 185); opinion (item 183); Atlantic Monthly, National Geographic, Fortune, New Yorker (item 186). They rarely read love stories (item 063); feel that slow reading holds them back (item 082); do not complete many semesters of English courses (item 100); sleep 8 or more hours a night (item 233); and seldom have spells of dizziness or faintness (item 262).

High Authority need students reported that they have parents who speak fluently some foreign language other than French, German,

Table 29

Significant (p $\leq$.001) Correlations Between the SIB Items and the MIQ Advancement Scale

SIB Item Number	Descriptive Statement	r
248	Normal use of both hands	-0.11
189	Electrical appliances in home	-.10
166	Length of residence in present community	0.09
013	Graphic arts	0.09
113	Discusses college plans with teacher or principal	0.09
119	Discusses school work with school counselor	0.09
117	Discusses college plans with school counselor	0.09
055	Number of books read	-0.09
002	School subject matter clubs	0.08
100	Number of English courses	0.08
004	Hobby clubs	0.08
124	Discusses after-school plans with school counselor	0.08
LABOR	Has one parent employed as a laborer	-0.08
BROKEN	Comes from a broken home	-0.07
HERE	Has lived in the same area for entire life	0.07
129	Main means of family support	0.07

Italian, Spanish or Portuguese, Russian, or Slavic, Hebrew, Scandinavian, or Oriental (item 165). (It was speculated that the students could have misinterpreted the phrase, "some other foreign language," to mean English.) The high Authority students have fewer electrical appliances (item 189) and media appliances (item 190) in their homes; live in multiple dwellings rather than single dwellings (item 169); earn most of their own spending money (item 048); are younger when they begin earning money (item 034); more often hold regular summer jobs (item 035); do not spend much time doing chores around the house (item 033); more often work in retail stores (item 042); rarely have needlecraft hobbies (item 024); often go hunting or fishing (item 028); often play baseball, football, and basketball (item 026); frequently are captains of athletic teams (item 012); often work in metal working (item 021), cabinet or woodworking (item 020), mechanical and auto repairs (item 022); have at least one parent employed as a clerical or sales person (item CLRSAL); and have a family income derived from some source other than a fixed salary, wages, commissions, or royalties (item OTSOUR). These correlates portray a picture of a working class, upward-mobile "status-seeker."

Many of the correlates for Authority give credence to the following clinical hunch: due to societal role expectations, males seek more symbolic male-value reinforcers such as authority, while females seek more symbolic female-value reinforcers such as social service.

Table 30 shows the significant correlates of Authority.

Company Policies and Practices

Four significant correlates were found for Company Policies and Practices. Students high on the Company Policies and Practices need tended not to participate in metal working (item 021); were rarely members of hobby clubs (item 004); had family incomes derived from a fixed salary (item FIXSAL); and were enrolled in some educational program other than a college preparatory program, business program, or vocational program (item OTHER). Table 31 shows the significant correlates of Company Policies and Practices.

Compensation

Eight significant correlates were found for Compensation. Students high on Compensation reported that they do not enjoy writing reports or compositions (item 071); like to read comic books (item 062); complete fewer semesters of science courses (item 097); do not discuss their after school plans with other adults or friends (items 128 and 127); are a twin or triplet (item 199); have at least one parent employed in a large company (item LGCOM) and at least one parent employed as a clerical or sales person (CLRSAL).

Table 32 shows the significant correlates of Compensation.

Co-Workers

Meresman (1975) reported that students high on Co-Workers tended to seek peers when solving problems and to seek advice from their brothers, sisters, and friends rather than their parents. These findings were not supported in the present study. Only four

Table 30

Significant ($p \leq .001$) Correlations Between the SIB Items and the MIQ Authority Scale

SIB Item Number	Descriptive Statement	r
160	Sewing, knitting, and crocheting	-0.14
024	Hunting and fishing	-0.12
182	Business magazines in home	0.12
169	Type of building lived in	0.12
185	Science fiction magazines in home	0.12
033	Time doing chores around the house	-0.11
233	Average number of hours of sleep a night	0.11
189	Electrical appliances in home	-0.10
183	Opinion magazines in home	0.10
190	Communication appliances in home	-0.10
063	Love stories read	-0.10
262	Has spells of dizziness	0.10
035	Number of summers worked for pay	0.09
127	Discusses after-school plans with friends his own age	-0.09
022	Mechanical or auto repair	-0.09
186	Atlantic Monthly, Fortune, New Yorker in home	0.09

Table 30 (Continued)

SIB Item Number	Descriptive Statement	r
165	Parental facility in some other language	-0.09
020	Cabinet or woodworking	-0.09
021	Metal working	-0.09
042	Retail store work, stock work, delivery, etc.	-0.09
012	Captaincy of athletic teams	0.08
082	Slow reading holds me back	-0.08
048	Money from a job	0.08
034	Age at which first money was earned	-0.08
199	Respondent is a twin or triplet	0.08
026	Participation in sports	-0.08
100	Number of English courses	-0.08
CLRSAL	Has one parent employed as a clerical/sales person	-0.08
OTSOUR	Family income derived from unusual source	0.07

Table 31

Significant (p $\leq$ .001) Correlations Between the SIB Items and the MIQ Company Policies and Practices Scale

SIB Item Number	Descriptive Statement	r
021	Metal working	0.08
004	Hobby clubs	0.08
FIXSAL	Family income is derived from a fixed salary	0.08
OTHER	Enrolled in program other than college preparatory, business, or vocational program	-0.07

Table 32

Significant (p ≤ .001) Correlations Between the SIB Items and the MIQ Compensation Scale

SIB Item Number	Descriptive Statement	r
128	Discusses after-school plans with other adults	-0.10
071	Enjoys writing reports	0.10
CLRSAL	Has one parent employed as a clerical/sales person	0.08
062	Number of comic books read	0.08
127	Discusses after-school plans with friends his own age	-0.08
097	Number of science courses	-0.08
LGCOM	One parent works for a large company	-0.07
199	Respondent is a twin or triplet	0.07

Table 33

Significant (p ≤ .001) Correlations Between the SIB Items and the MIQ Co-Workers Scale

SIB Item Number	Descriptive Statement	r
071	Enjoys writing reports	0.09
021	Metal working	0.09
254	Has asthma	0.09
LGCOM	One parent works for a large company	-0.08

significant correlates were found and none of them were clearly interpretable. The students who were high on Co-Workers: tend not to enjoy writing reports or compositions (item 071); do not participate in metal working (item 021); do not have asthma (item 254); and have at least one parent employed in a large company (item LGCOM).

Table 33 shows the significant correlates of Co-Workers.

Creativity

Twenty statistically significant correlates emerged for Creativity. These correlates are psychologically consistent with a clinical expectation that people high on this need would have experienced a rich environment conducive to the expression of one's ideas. The high Creativity students: have homes with many books (item 175); have their own rooms, desks, and typewriters (item 194); have much fine arts equipment in their homes (item 191); and have fewer hand tools (item 195) but more power tools (item 196) in their homes.

Having an environment that is conducive to creativity is further supported by the fact that high Creativity students have fathers with higher levels of education (item 214); have mothers with higher levels of education (item 215); have at least one parent employed as a professional/technical person (item PROTEC); have more electrical appliances in their homes (item 189); have fewer people living in the home (item 222); have fewer brothers and sisters (item 217); and live in more expensive homes (item 171).

All of these socio-economic factors indicate that high Creativity students may have also been exposed to a rich history of experiences and to parental encouragement in exploring their ideas. In further support of this observation, the students reported that they discuss their after-school plans with both their mothers (item 122) and their fathers (item 121) and are enrolled in a college preparatory program (item COLPREP) or a business education program (item BUSNS).

In this study, unlike the college students studied by Meresman (1975), the high school students high on Creativity belong to many clubs (item 227). Meresman (1975) found the opposite to be true and concluded that the activities of students high on Creativity were of an individual nature because there was no evidence of group activities.

Table 34 shows the significant correlates of Creativity.

Independence

For Independence, 16 SIB items were significantly related. Meresman (1975) found only two BI items to be significant correlates and could find no interpretation for one of the items.

Students high on Independence in the present study reported having many regular summer jobs for pay (item 035). Their families appear not to be transient because they tended to live in fewer homes (item 168). They have poorer grades in foreign language courses (item 107); take fewer semesters of the more rigorous courses, such as math (item 103), foreign languages (item 098), English (item 100), and science (item 097); and reported that they are not able to pick out important points to learn when studying for tests (item 085).

In addition, these students reported having at least one parent employed in a small company (item SMCOM) or by the government (item

Table 34

Significant ($p \leq .001$) Correlations Between the SIB Items and the MIQ Creativity Scale

SIB Item Number	Descriptive Statement	r
194	Their own room, desk, and typewriter	0.12
214	Father's educational level	0.11
192	Fine arts equipment in home	0.10
215	Mother's educational level	0.10
217	Number of children in home	-0.10
171	Present value of home	0.10
121	Discusses after-school plans with father	0.10
191	Number of decorative elements in home	0.10
227	Membership in clubs	0.09
122	Discusses after-school plans with mother	0.09
108	Grades in history and social studies	0.09
195	Hand tools in home	-0.09
109	Grades in English courses	-0.09
222	Number of people in home	-0.09
196	Power tools in home	0.09
189	Electrical appliances in home	0.09
175	Number of books in home	0.09
COLPREP	Is enrolled in a college preparatory program	0.07
BUSNS	Is enrolled in a business education program	-0.07

Table 34 (Continued)

SIB Item Number	Descriptive Statement	r
PROTEC	Has one parent employed as a professional or technical person	0.07

GOVT) and being enrolled in a college preparatory program (item COLPREP) or a vocational program (item VOC).

Table 35 shows the significant correlates of Independence.

Moral Values

Fourteen significant correlates were found for Moral Values. Students high on Moral Values tend to belong to many clubs and organizations (item 227); feel that their grades reflect their abilities accurately; read plays, essays, poetry, and classics (item 059); read many books (item 055); rarely ever go out for fun or recreation (item 054); believe that being a fast reader helps them to complete their lessons (item 066); read many love stories (item 063); have very few dates (item 051); are enrolled in a general education program (item GENERAL); and have at least one parent employed as a professional/technical person (item PROTEC). Meresman (1975) identified four BI correlates; however, none of these were supported in the present findings.

Table 36 shows the significant correlates of Moral Values.

Recognition

Only two significant correlates emerged for Recognition. Meresman (1975) reported five BI items with significant linear correlations and one curvilinear relationship for this need. Interestingly, the curvilinear relationship suggested that non-readers were higher on Recognition than readers, but that the number of books read per month for readers is not highly related to Recognition. In this study, the only significant correlate which supported Meresman's

Table 35

Significant (p $\leq$.001) Correlations Between the SIB Items and the MIQ Independence Scale

SIB Item Number	Descriptive Statement	r
COLPREP	Is enrolled in a college preparatory program	-0.12
168	Number of different residences	-0.11
107	Grades in foreign languages	0.11
019	Making or repairing electrical equipment	-0.11
103	Number of math courses	-0.11
100	Number of English courses	-0.11
SMCOM	One parent is employed by a small company	0.10
098	Number of foreign language courses	-0.10
127	Discusses after-school plans with friends his own age	-0.10
VOC	Is enrolled in a business education program	0.10
035	Number of summers worked for pay	0.09
124	Discusses after-school plans with school counselor	-0.09
097	Number of science courses	-0.09
085	Can pick out important points when studying	0.08
GOVT	One parent is employed by a government agency	-0.08
167	Description of community	0.07

Table 36

Significant ($p \leq .001$) Correlations Between the SIB Items and the MIQ Moral Values Scale

SIB Item Number	Descriptive Statement	r
227	Membership in clubs	0.11
067	Grades accurately reflect abilities	-0.10
063	Love stories read	0.10
059	Number of plays, poetry, essays, and classics read	0.09
079	Can't keep mind on what teacher is saying	0.09
006	Church groups	-0.09
054	Evenings out a week for fun	-0.09
055	Number of books read	0.09
072	Failure to pay attention lowers grades	0.08
066	Is a fast reader	-0.08
051	Number of dates per week	-0.08
074	Difficult assignments are a challenge	0.08
GENERAL	Is enrolled in a general education program	-0.07
PROTEC	Has one parent employed as a professional or technical person	0.07

finding was that students high on Recognition read few books (item 055). In addition, students reported that their family income came from sources other than a fixed salary, wages, commissions, or royalties (item OTSOUR).

Table 37 shows the significant correlates of Recognition.

Responsibility

Nineteen SIB items were significantly related to the Responsibility need, compared with the six BI correlates reported by Meresman (1975). Meresman suggested that students who were high on Responsibility came from impoverished homes and tended to report that their parents showed little interest in helping them make vocational plans. These findings were not supported in this study in which the high Responsibility students reported just the opposite--that they often discussed their after-school plans with their fathers (item 121).

Meresman also indicated that students high on Responsibility tend to read more books per month. In this study, too, high Responsibility students reported that they have more books in their homes (item 175). These students also tend to have fathers (item 214) and mothers (item 215) with higher levels of education; have more expensive homes (items 171); have many hand and power tools in their homes (items 195 and 196); have many electrical appliances in their homes (item 189); have much sports equipment (item 193); and have at least one parent employed as a professional/technical person (item PROTEC).

Those students high on Responsibility belong to many clubs and organizations (item 227); often go hunting and fishing (item 028);

Table 37

Significant ($p \leq .001$) Correlations Between the SIB Items and the MIQ Recognition Scale

SIB Item Number	Descriptive Statement	r
055	Number of books read	-0.10
OTSOUR	Family income is derived from an unusual source	0.08

rarely make or repair electronic equipment (019); very often do metal working (item 021); participate in student government activities, Boy Scouts of America, Girl Scouts of America, etc, (item 278); and rarely read love stories (item 063). One seemingly inconsistent correlate suggests that these students tend to have needlecraft hobbies (item 024), which might indicate a female subgroup.

Table 38 shows the significant correlates of Responsibility.

Security

Based on one correlate, Meresman (1975) speculated that high Security students tended to come from stable environments in that they rarely changed schools. This relationship was not supported in this study, although twelve different significant correlations were found.

Most of the correlates found for Security were psychologically consistent. Students high on Security rarely are members of neighborhood groups (item 007); rarely join clubs for debating, drama, and science (item 003); rarely act, sing, or dance in public (item 014); rarely do drawing, sculptoring, or painting as a hobby (item 013) and rarely read plays, poetry, essays, and the classics (item 059). Although they reported reading many books (item 005), they tend not to have in their homes books such as science fiction (item 057), science non-fiction (item 058), and political, historical, biographical, and world affairs books (item 060). In addition, these students do not come from broken homes (item BROKEN) and their family income is mostly derived from professional fees (item PROFEE).

Table 39 shows the significant correlates of Security.

Table 38

Significant ($p \leq .001$) Correlations Between the SIB Items and the MIQ Responsibility Scale

SIB Item Number	Descriptive Statement	r
214	Father's educational level	0.12
215	Mother's educational level	0.12
171	Present value of home	0.12
175	Number of books in home	0.11
194	Their own room, desk, and typewriter	0.11
028	Hunting and fishing	-0.10
278	Student government, boy scouts, girl scouts, etc.	0.10
121	Discusses after-school plans with father	0.10
196	Power tools in home	0.09
024	Sewing, knitting, crocheting	-0.09
227	Membership in clubs	0.09
063	Love stories read	-0.09
019	Making or repairing electrical equipment	0.09
103	Number of mathematics courses	0.09
189	Electrical appliances in home	0.09
021	Metal working	-0.09
193	Sports equipment in home	0.09
195	Hand tools in home	0.09
PROTEC	Has one parent employed as a professional or technical person	0.08

Table 39

Significant ($p \leq .001$) Correlations Between the SIB Items and the MIQ Security Scale

SIB Item Number	Descriptive Statement	r
057	Science fiction books read	-0.11
007	Informal neighborhood groups	0.11
058	Science non-fiction books read	-0.10
005	Number of books read	0.10
060	Books read on politics, world affairs, history, etc.	-0.10
071	Enjoys writing reports or compositions	0.10
013	Graphic arts	0.10
003	Public speaking/performance clubs	0.10
014	Performing arts	0.09
059	Number of plays, poetry, essays, and classics read	-0.08
BROKEN	Comes from a broken home	-0.07
PROFEE	Family income is derived from professional fees	0.07

Social Service

Eighteen SIB items were found to be significantly related to Social Service. Meresman (1975) reported four linear and four curvilinear relationships. From these relationships, Meresman speculated that high Social Service students were characterized as having a rich history of social interaction. Evidence to support this speculation was found in this study. High Social Service students reported that they belong to many clubs and organizations (item 227).

Adding another aspect to these results were three correlates that concerned discussing after-school plans with their mothers (item 122), their friends (item 127), and with other adults (item 128).

The following significant correlates indicate that many of the students high on Social Service were females, since they reported that they tend to do needlecrafts (item 024); have cooking as a hobby (item 025); read many love stories (item 063); rarely do metal working (item 021); and rarely make or repair electrical equipment (item 019). However, students high on Social Service also reported that they often collect stamps, coins, rocks, and insects (item 015) and often make jewelry, pottery, or leather goods (item 018).

Table 40 shows the significant correlates for Social Service.

Social Status

Twenty significant SIB correlates were found for Social Status. Meresman (1975) found 10 BI items to be significant. Meresman suggested that (a) students high on Social Status chose not to read because they didn't use their library cards and (b) they came from

Table 40

Significant (p ≤ .001) Correlations Between the SIB Items and the MIQ Social Service Scale

SIB Item Number	Descriptive Statement	r
024	Sewing, knitting, crocheting	-0.18
025	Cooking	-0.15
063	Love stories read	0.15
020	Cabinet or woodworking	0.13
223	Respondent's height	-0.12
015	Collecting stamps, coins, etc.	-0.12
021	Metal working	0.12
227	Membership in clubs	0.12
224	Respondent's weight	-0.11
028	Hunting and fishing	0.11
102	Number of vocational courses	-0.11
122	Discuss after-school plans with mother	0.10
019	Making or repairing electrical equipment	0.10
076	Teachers criticize for not paying attention	0.10
018	Making jewelery, pottery, etc.	-0.10
127	Discusses after-school plans with friends his own age	0.10
037	Delivering newspapers, baby-sitting, etc.	-0.10
128	Discuss after-school plans with other adults	0.09

families with high incomes. The first speculation was supported in this study, with high Social Status students reporting that they read comic books (item 062) but that they have read few books in the past year (item 055), even though they had many magazines in the home, such as business (item 182), public opinion (item 183), Parent's magazine (item 188), movie magazines, love stories and detective stories (item 178), professional and trade journals (item 184). However, high Social Status students in the study do not appear to come from families with high incomes. In fact, these students reported that they own few electrical appliances (item 189); very often hold part-time work for pay (item 045); have parents who speak fluent Spanish and Portuguese (item 160); have family incomes from some source other than a fixed salary, wages, commissions, or royalties (item OTSOUR); and are enrolled in college preparatory programs (item COLPREP).

Students high on Social Status also reported that they get more sleep than other students their age (item 267); get 8 or more hours of sleep a night (item 233); feel that they accomplish a lot for the time spent studying (item 069); rarely discuss their after-school plans with friends (item 127); and are often captains of athletic teams (item 012).

Table 41 shows the significant correlates for Social Status.

Supervision-Human Relations

Only one significant correlate emerged for Supervision-Human Relations. The students high on this need reported that they do not

Table 41

Significant ($p \leq .001$) Correlations Between the SIB Items and the MIQ Social Status Scale

SIB Item Number	Descriptive Statement	r
182	Business magazines in home	0.13
183	Opinion magazines in home	0.11
OTSOUR	Family income is derived from an unusual source	0.11
257	Sleeps more than others	-0.10
233	Average number of hours of sleep a night	0.10
033	Time doing chores around the house	-0.10
189	Electrical appliances in home	-0.10
188	Parent's Magazine, Boy's Life, American Girl in home	0.09
069	Accomplishes very little compared to time spent	0.09
062	Number of comic books read	0.09
160	Parental facility in Spanish or Portuguese	-0.09
082	Slow reading holds me back	-0.09
178	Movie, love, detective magazines in home	0.09
100	Number of English courses	-0.10
127	Discusses after-school plans with friends his own age	-0.09
184	Professional or trade journals in home	0.08
045	Other work for pay	-0.08
012	Captaincy of athletic teams	0.08

Table 41 (Continued)

SIB Item Number	Descriptive Statement	r
055	Number of books read	-0.08
COLPREP	Is enrolled in a college preparatory program	-0.07

take special exercises (item 269). No interpretable pattern can be drawn from this single correlate. Table 42 shows the significant correlate for Supervision-Human Relations.

Supervision-Technical

Only two significant correlates emerged for Supervision-Technical. The students high on Supervision-Technical reported that they have poor grades in mathematics (item 105) and have a family income derived from some source other than a fixed salary, wages, commissions, or royalties (item OTSOUR). No interpretable pattern can be drawn from these two correlates.

Table 43 shows the significant correlates for Supervision-Technical.

Variety

Only two significant correlates were found for Variety, with students high on Variety tending to report that they have fathers who are responsible for money and merchandise (item 132) and that they are enrolled in college preparatory programs (item COLPREP). No interpretable pattern can be drawn from these two correlates.

Table 44 shows the significant correlates for Variety.

Working Conditions

Ten SIB items were significantly related to the need Working Conditions. These are basically psychologically consistent: students high on Working Conditions reported that they have poor overall grades (item 112); never do more work than a course requires (item 064); have poor English grades (item 109); have poor science grades (item 106);

Table 42

Significant ($p \leq .001$) Correlations Between the SIB Items and the MIQ Supervision-Human Relations Scale

SIB Item Number	Descriptive Statement	r
269	Takes special exercises	0.09

Table 43

Significant ($p \leq .001$) Correlations Between the SIB Items and the MIQ Supervision-Technical Scale

SIB Item Number	Descriptive Statement	r
105	Grades in mathematics	0.09
OTSOUR	Family income is derived from an unusual source	0.07

Table 44

Significant ($p \leq .001$) Correlations Between the SIB Items and the MIQ Variety Scale

SIB Item Number	Descriptive Statement	r
132	Father's responsibility for property and money	0.09
COLPREP	Is enrolled in a college preparatory program	-0.07

rarely read books on politics, world affairs, or history (item 060); take few science and social studies courses (items 097 and 099); are enrolled in college preparatory programs (item COLPREP); and have at least one parent employed as a clerical or sales person (item CLRSAL).

Table 45 shows the significant correlates for Working Conditions.

TCTs

Finally, SIB items were correlated with the TCT scores. Ninety-one significant correlates emerged. The responses of the students high on TCT suggest two possible subgroups: high TCT students from a rich environment with good scholarship and high TCT students from a poor environment with poor scholarship.

High TCT scores were associated with students who reported: few media appliances in their homes (item 190); few electrical appliances in their homes (item 189); few discussions of after-school plans with their mothers, fathers, friends, other adults, and school counselors (items 122, 121, 127, 128, and 124); poor grades in foreign languages, English, and business courses (items 107, 109, and 111); very little sports equipment in their homes (item 193); missing assignments because they didn't pay attention in school (item 075); living in many dwellings (item 168); lower grades because they didn't pay attention in class (item 072); taking fewer math and foreign language courses (items 103 and 098); always being behind on school assignments (item 080); little fine arts equipment in their homes (item 192); difficulty with the mechanics of English composition (item 078); mothers and fathers with lower levels of education (items 215

Table 45

Significant ($p \leq .001$) Correlations Between the SIB Items and the MIQ Working Conditions Scale

SIB Item Number	Descriptive Statement	r
071	Enjoys writing reports or compositions	0.12
112	Grades in all courses	0.09
CLRSAL	One parent is employed as a clerical/sales person	-0.09
064	Does little more than course requires	0.09
097	Number of science courses	-0.09
109	Grades in English courses	0.09
106	Grades in science	0.09
099	Number of social studies courses	-0.09
060	Books read on politics, world affairs, history, etc.	-0.08
COLPREP	Is enrolled in a college preparatory program	-0.07

and 214); difficulty expressing themselves in writing (item 065); never keeping up to date on their assignments (item 087); living in many different dwellings (item 168); feeling that slow reading had not held them back in their school work (item 082); few discussions of their college plans with the school counselor (item 117); not having their own room, desk, or typewriter (item 194); having rheumatic fever (item 253); having worked in retail stores during summers for pay (item 042); reading many comic books (item 062); having few hand tools in the home (item 195); often not having the normal use of both hands (item 248); having fathers that worked for pay on more than one job (item 130); rarely playing golf or tennis (item 030); having two or more brothers or sisters who dropped out of high school (item 200); being young when they started earning money (item 034); feeling that a lot of their money came from some source other than family, allowance, jobs, etc. (item 049); having few decorative elements in the home (item 191); never making sure they understood an assignment before beginning it (item 068); having many part-time summer jobs for pay (item 035); having problems remembering what they read (item 088); only doing what is required for assignments (item 077); and not being able to concentrate on what they read because their minds wandered (item 086). In addition, students reported coming from broken homes (item BROKEN); not living with both parents (item MAPA); having a family income derived from some source other than a fixed salary, wages, commissions, or royalties (item OTSOUR); and not having parents employed as a professional/technical person (item PROTEC) or as a clerical/sales person (item CLRSAL).

In contrast to the above, high TCT scores were also associated with students who reported: reading many science fiction magazines (item 185); having books on mechanics, electronics, and aviation in the home (item 179); having business, movie, opinion, farm, and news/pictorial magazines in the home (items 182, 178, 108, 180, and 181); winning many awards in foreign languages, math, science, debating, oratory, and writing (items 273, 272, 271, and 274); taking many English and science courses (items 100 and 097); feeling that they accomplish a lot for the time they spend studying (item 069); being active in hobby clubs (item 004). In addition, students reported being enrolled in a college preparatory program (item COLPREP) or a business education program (item BUSNS).

Table 46 shows the significant correlates for TCT.

Hypothesis Six: Similar sets of relationships between life history factors and vocational needs can be found between or among various sex-by-grade samples.

Given 274 correlations between all SIB items and each MIQ scale, and eight sex-by-grade groups, at least 110 significant correlations would be expected by chance at the .05 level of significance and 22 significant correlations at the .01 level, for each scale. Table 47 summarizes the number of significant correlations (at $p \leq .01$) found for each sex-by-grade group.

Table 46

Significant (p ≤ .001) Correlations Between the SIB Items and the MIQ TCT Scale

SIB Item Number	Descriptive Statement	r
190	Communications appliances in home	-0.18
189	Electrical appliances in home	-0.17
185	Science fiction magazines in home	0.17
COLPREP	Is enrolled in a college preparatory program	-0.17
122	Discusses after-school plans with mother	-0.15
179	Mechanics, electronics, aviation magazines in home	0.15
107	Grades in foreign languages	0.15
182	Business magazines in home	0.15
178	Movie, love, detective magazines in home	0.15
127	Discusses after-school plans with friends his own age	-0.15
193	Sports equipment in home	-0.14
267	Sleeps more than others	-0.14
075	Misses assignment by not paying attention	-0.14
273	Number of foreign language awards	0.13
100	Number of English courses	0.13
109	Grades in English courses	0.13
168	Number of different residences	0.13

Table 46 (Continued)

SIB Item Number	Descriptive Statement	r
069	Accomplishes very little compared to time spent	0.13
108	Opinion magazines in home	0.13
097	Number of science courses	0.13
004	Hobby clubs	-0.12
233	Respondent's height	0.12
084	Professional or trade journals in home	-0.12
072	Failure to pay attention lowers grade	-0.12
214	Father's educational level	-0.12
103	Number of math courses	-0.12
121	Discusses after-school plans with father	-0.12
111	Grades in business courses	0.11
080	Gets behind in assignments	-0.11
272	Number of mathematics awards	0.11
192	Fine arts equipment in home	-0.11
078	Difficulty with mechanics of English composition	-0.11
215	Mother's educational level	-0.11
065	Trouble expressing self in writing	0.11
087	Keeps up to date on assignments	0.11
021	Metal working	-0.11

Table 46 (Continued)

SIB Item Number	Descriptive Statement	r
175	Number of books in home	-0.11
180	Farm magazines in home	0.11
169	Type of building lived in	0.11
082	Slow reading holds me back	0.11
229	Longest period of illness	0.11
117	Discusses college plans with school counselor	-0.11
194	Their own room, desk, and typewriter	-0.11
022	Mechanical or auto repair	-0.11
271	Number of science awards	0.11
253	Had rheumatic fever	-0.11
199	Respondent is twin or triplet	0.11
042	Retail store work, stock work, delivery, etc.	-0.10
020	Cabinet or wood working	0.10
062	Number of comic books read	0.10
195	Hand tools in home	-0.10
019	Making or repairing electrical equipment	-0.10
248	Normal use of both hands	0.10
130	Number of jobs that father works on	0.10
030	Playing golf, tennis, etc.	0.10
200	Number of brothers/sisters leaving school	0.10

Table 46 (Continued)

SIB Item Number	Descriptive Statement	r
079	Can't pay attention	0.10
102	Number of vocational courses	0.10
FIXSAL	Family income is derived from a fixed salary	-0.10
149	Mother active in political groups	-0.10
VOC	Is enrolled in a vocational program	0.10
181	News/pictorial magazines in home	0.09
028	Hunting and fishing	-0.09
098	Number of foreign language courses	-0.09
PROTEC	One parent is employed as a professional or technical person	-0.09
016	Building models	-0.09
034	Age at which first money was earned	-0.09
186	Atlantic Monthly, Fortune, New Yorker in home	0.09
274	Number of writing, debating, oratory awards	0.09
049	Money from some other source	0.09
155	Mother active in civic organizations	-0.09
191	Number of decorative elements in home	-0.09
CLRSAL	One parent is employed as a clerical/sales person	-0.09
188	Parent's magazine, Boy's Life, American Girl in home	0.09
OTSOUR	Family income is derived from an unusual source	0.09

Table 46 (Continued)

SIB Item Number	Descriptive Statement	r
201	Number of brothers/sisters in vocational school	0.09
MAPA	Lives at home with both parents	-0.09
128	Discusses after-school plans with other adults	-0.08
BROKEN	Comes from a broken home	0.08
150	Mother active in labor or trade organizations	-0.08
124	Discusses after-school plans with school counselor	-0.08
068	Makes sure of assignments before beginning	0.08
035	Number of summers worked for pay	0.08
002	School subject matter clubs	-0.08
088	Has trouble remembering what is read	-0.08
077	If dislikes course, does only enough to get by	-0.08
136	Parents born in U.S.	-0.08
086	Can't concentrate on reading	-0.08
187	Reader's Digest, Coronet in home	0.07
BUSNS	Is enrolled in a business education program	0.07
129	Main means of family support	0.07

Across all groups, Table 47 shows more than 22 correlations for all MIQ scales except Compensation, but less than 110 correlations for any scale.

For 10 MIQ scales, at least one of the eight groups had no significant correlations. For eight scales, at least one group had only one significant correlation. Only for two scales were there at least two significant correlations for all groups. These findings indicate that it was not possible to find similar sets of SIB-MIQ relationships among the sex-by-grade samples. Appendix D lists the SIB items correlating significantly with each MIQ scale for each sex-by-grade group. An examination of Appendix D will show very few SIB-MIQ correlations replicated across groups.

Table 47

Number of Significant (p ≤.01) Correlations Between SIB Items and Each MIQ Scale for the Male and Female Groups in the Eighth, Ninth, Tenth, and Eleventh Grades

MIQ	Eighth		Ninth		Tenth		Eleventh		Total
Scale	Male	Female	Male	Female	Male	Female	Male	Female	
AU	6	8	1	0	7	7	4	4	37
Ach	5	2	7	0	5	8	11	4	32
Act	0	7	2	1	21	20	11	8	70
Adv	12	1	2	1	3	10	4	1	34
Aut	5	0	5	2	5	4	0	2	23
CPP	5	0	4	2	8	5	5	8	37
Com	4	2	0	1	3	2	3	1	16
CoW	4	1	5	3	5	5	2	4	29
Cre	12	6	2	3	8	7	3	9	50
Ind	4	2	3	1	13	10	10	10	53
MV	2	5	9	3	11	13	7	10	60
Rec	4	3	2	3	8	4	1	3	28
Res	6	5	1	4	8	7	2	6	39
Sec	6	6	1	1	7	11	4	13	49
SSe	4	1	4	4	9	7	0	2	31
SSt	7	4	6	6	7	11	0	5	46
SHR	4	1	4	6	5	4	3	5	32
ST	3	4	1	0	5	9	2	3	27
Var	6	0	3	4	7	7	2	0	29
WC	2	2	3	5	4	1	2	17	36
TCT	8	15	3	4	13	18	13	12	86
TOTAL	109	75	68	54	162	170	79	127	844

CHAPTER V

SUMMARY OF FINDINGS AND RECOMMENDATIONS

This chapter contains: (a) Summary of the Findings, (b) Recommendations for Educational Practice, and (c) Recommendations for Research.

The Minnesota Importance Questionnaire (MIQ), a measure of vocational needs, and the Student Information Blank (SIB), a questionnaire about life history, were administered to 8th, 9th, 10th, and 11th grade students in 20 high schools in 14 states. Usable responses were obtained from 1,760 students. Mean differences and rank order correlations in needs between sex groups, among grade groups, and between sex-within-grade groups were examined. Relationships between SIB items and MIQ scale scores were identified.

Summary of the Findings

Following is a summary of the findings of the study.

Individual Differences in Needs

The results of this study contain preliminary evidence that suggests the existence of similar average patterns of needs across grade, sex, and sex-by-grade groups. In this study, it was found that the most important vocational need for all groups was Ability Utilization. Within each group, the students were in strong agreement about the importance of Ability Utilization, as reflected by the low standard deviations. Other scales that had high means and low variabilities for almost all sex, grade, and sex-by-grade groups were

Achievement, Security, and Advancement. Data bearing on these observations are presented in Table 48. The one exception to these generalizations was the importance that female students placed on Social Service which, for these students, showed high means but also large variabilities.

Comparability across grades was also observed for the needs considered to be the least important by all sex, grade, and sex-by-grade groups. The lowest means were found for Authority, Social Status, Independence, and Activity. However, more variability was observed in students' opinions about these needs, as demonstrated by the relatively higher standard deviations.

Even though similar patterns of needs were found across groups, significant variability within the various groups was observed for all needs. Enough variability was observed to require that each student's unique pattern of needs be considered when planning for that student's future training or future career.

The Development of Needs

In her study of 8th and 10th grade students, Gray (1974) found moderately high MIQ profile test-retest correlations over a two-year period (a median of +.62 for the total sample, +.60 for the 8th-to-10th grade sample, +.65 for the 10th-to-12th grade sample). Hendel and Weiss (1970) found median profile test-retest correlations of +.78 and +.71 for their two samples of 12th graders across a 10-month interval. These data indicate that for many, if not the majority of high school students, the pattern of needs is fairly stable over at

Table 48

Means and Standard Deviations of the Four Most Important and the Four Least Important MIQ Scales, by Group

Group		Four Most Important			Four Least Important		
		Scale	Mean	SD	Scale	Mean	SD
Sex	Female	AU	1.47	0.66	Aut	-0.37	0.80
		SSe	1.37	0.81	Ind	0.05	0.83
		Ach	1.31	0.62	SSt	0.17	1.01
		Sec	1.21	0.76	Act	0.32	0.77
	Male	AU	1.34	0.67	Aut	-0.11	0.88
		Adv	1.23	0.74	Act	0.14	0.81
		Sec	1.23	0.79	Ind	0.12	0.85
		Ach	1.20	0.63	SSt	0.28	0.98
Grade	Eighth	AU	1.22	0.69	Aut	-0.09	0.87
		SSe	1.12	0.81	Ind	0.23	0.90
		Sec	1.09	0.77	Act	0.28	0.80
		Ach	1.06	0.63	SSt	0.45	0.99
	Ninth	AU	1.46	0.64	Aut	-0.09	0.88
		Sec	1.29	0.82	Ind	0.14	0.86
		Ach	1.25	0.60	Act	0.30	0.83
		Adv	1.20	0.70	SSt	0.37	0.94
		SSe	1.20	0.86			
	Tenth	AU	1.42	0.67	Aut	-0.34	0.83
		Ach	1.33	0.63	Ind	0.07	0.83
		Sec	1.21	0.68	SSt	0.12	0.98
		Adv	1.16	0.73	Act	0.20	0.75
	Eleventh	AU	1.46	0.64	Aut	-0.32	0.81
		Adv	1.38	0.73	Ind	-0.01	0.80
		Ach	1.32	0.62	SSt	0.12	1.01
		Sec	1.27	0.82	Act	0.19	0.79
Sex-by-Grade	Eighth Grade Females	AU	1.22	0.69	Aut	-0.13	0.83
		SSe	1.18	0.82	Ind	0.16	0.87
		Ach	1.10	0.66	Act	0.32	0.77
		WC	1.03	0.59	SSt	0.45	0.99
					SHR	0.45	0.81

Table 48 (Continued)

Group	Four Most Important			Four Least Important		
	Scale	Mean	SD	Scale	Mean	SD
Eighth Grade Males	AU	1.23	0.69	Aut	-0.04	0.90
	Sec	1.16	0.82	Act	0.24	0.82
	WC	1.08	0.57	Ind	0.29	0.93
	SSe	1.05	0.80	SSt	0.44	0.98
Ninth Grade Females	AU	1.50	0.63	Aut	-0.21	0.84
	SSe	1.37	0.85	Ind	0.09	0.86
	Ach	1.28	0.60	Act	0.33	0.84
	Sec	1.27	0.83	SSt	0.44	0.91
				Var	0.44	1.01
Ninth Grade Males	AU	1.42	0.65	Aut	-0.03	0.91
	Sec	1.30	0.81	Ind	0.19	0.86
	Adv	1.28	0.71	Act	0.27	0.81
	Ach	1.22	0.59	SSt	0.29	0.97
Tenth Grade Females	AU	1.57	0.64	Aut	-0.50	0.74
	SSe	1.45	0.79	SSt	0.07	1.02
	Ach	1.39	0.60	Ind	0.09	0.80
	Sec	1.29	0.66	Act	0.30	0.71
Tenth Grade Males	Ach	1.26	0.66	Aut	-0.18	0.91
	AU	1.26	0.70	Ind	0.05	0.86
	Adv	1.15	0.73	Act	0.09	0.79
	Sec	1.12	0.69	SSt	0.16	0.94
Eleventh Grade Females	AU	1.51	0.64	Aut	-0.48	0.79
	SSe	1.40	0.80	Ind	-0.06	0.82
	Adv	1.38	0.71	SSt	-0.04	1.00
	Ach	1.38	0.61	Act	0.32	0.78
Eleventh Grade Males	AU	1.41	0.63	Aut	-0.16	0.82
	Adv	1.37	0.75	Ind	0.04	0.78
	Sec	1.32	0.83	Act	0.06	0.80
	Ach	1.25	0.62	SSt	0.28	1.02

least two years. These findings also allow one to consider cross-sectional data (as obtained in this study) as reflecting developmental trends.

In this study, need stability was shown by the extremely high rank order correlations found between grade groups for both sexes for profiles of mean scale scores. These data appear to support the supposition that individuals usually live in relatively stable environments and develop stable patterns of needs even as early as the high school years.

The Origins of Needs

The Theory of Work Adjustment states that vocational needs (as well as other work personality characteristics) develop from individuals' response and reinforcement histories. In this study, the life history data were assumed to reflect students' response and reinforcement histories. As such they were expected to be related to vocational needs in consistent and meaningful ways. Confirmation of this expectation, in turn, would help justify their use by vocational educators and counselors as indicators of vocational needs.

The findings of the present study (see Tables 26 through 46) contain preliminary evidence that background data are indeed related to vocational needs. However, while there was evidence linking background data meaningfully to vocational needs, there was little evidence to support the generalizability of findings across groups. If it is true that the needs of high school students do not change drastically over time, it is reasonable to expect that the findings about biographical data would be repeated across groups. This expectation was not borne out in this study.

The findings of this research project add substantial supportive information to the construct validity of the MIQ in that they provide links between MIQ scores and reinforcement history. These findings, therefore, also enhance the Theory of Work Adjustment on which the MIQ is based.

Recommendations for Future Educational Practice

The data on stable preferences for certain stimulus conditions (i.e., needs) has practical implications for the vocational educator or trainer. These implications lie in two realms--the vocational guidance function and the curricular function of structuring educational experiences.

Vocational Guidance

Conscientious vocational educators assume responsibility for the guidance and placement of students. Vocational educators who know the work personalities of their students, as well as the reinforcer systems of jobs, are more likely to be able to help the students find appropriate situations in the world of work in which the students can realize their talents, that is, utilize their abilities and satisfy their needs. In providing counseling aid, vocational educators and counselors could use the MIQ with other kinds of information about students in order to understand the students' work personalities more accurately. Other information that describes various aspects of students' work personalities may be found in school records, work histories, biographical reports, inventories of vocational interests and general personality traits, and from counseling interviews. These kinds of supportive information, along with the MIQ assessment, could make vocational educators and counselors more confident in making clinical inferences from assessment data. For example, a low score on the MIQ Independence scale ("I could work alone on the job") could be interpreted more accurately if it was supported by other evidences of the student's gregarious nature. It could be confirmed by evidences of high participation in group activities in school records and biographical data. Also, it could be supported by high interest inventory scores for less solitary occupations. Further assessment might reveal that the student's part-time work experience was characterized by non-solitary occupations. By cumulating data, the vocational educator or counselor could help the student make those rational occupational choices that are more consistent with the student's developing work personality.

The Structuring of Educational Experiences

The findings of this study also have implications for classroom practice. If we understand the need patterns of students, we can develop plans for influencing their motivation to learn. Plans for motivating students can be developed better if the stability of their needs can be assumed. For example, the strongest need across all groups was for doing "something which makes use of my abilities." The resourceful teacher could make use of this knowledge by designing learning experiences that would allow students to utilize their particular patterns of abilities to the fullest. A major part of this effort should involve the determination of the students' present level of achievement so as to guide their future development from that point rather than from some preconceived starting point. If education is seen as the maximum development of each individual for adult roles, and if work is seen as a major life role, more attention should be directed toward the structuring of educational environments to facilitate the development of work personalities by providing for appropriate experience with a wide range of job requirement-reinforcer conditions (e.g., simulations, role-playing, and other exercises).

Recommendations for Research

Given the results of this study, the following recommendations for research seem to be in order:

1. An additional analysis that could be performed on the data in this study is the examination of the results for additional subgroups defined on the basis of various demographic factors, such as school grades (high achievers versus low achievers), parents' occupational group (clerical/sales versus professional/technical), etc.
2. A longitudinal study could be conducted to determine whether the students' vocational needs are in fact stable across time. This would substantiate the inference of need stability based on data gathered during this study.
3. The results of this study could be used as the basis for an experiment. Students with particularly low vocational needs

could be divided into two groups. One of these groups could serve as a control (i.e., non-intervention) group. The second group could be deliberately involved in various types of activities assessed by the Student Information Blank. The use of the MIQ as a pre- and post-test measure in this experiment could provide data indicating the possibility of deliberate positive influence on the development of students' vocational needs.

4. Additional information about the structure of adolescent vocational needs could be obtained by using the technique of factor analysis on the MIQ data in this study.
5. Additional information about the validity of the findings in this study could be generated by using the technique of multiple regression analysis or other similar multivariate prediction techniques.
6. In light of the fact that the findings about the Total Circular Triad (TCT) scores seem to indicate two separate groups of students (in rich environments vs. in poor environments), the SIB could be used to sort the students into different groups (according to the environment), and these groups could then be compared with respect to the development of their respective vocational needs.
7. Multiple regression techniques could be used with the data in this study to identify those combinations of life history correlates that would best predict the vocational needs of

individuals. Positive findings could lead to the development of a biographical inventory measure for assessing vocational needs.

Finally, substantiation of the results of this study through replication would be most desirable.

REFERENCES

REFERENCES

Albright, L. E. Minnesota Importance Questionnaire, in The Eighth Mental Measurements Yearbook, Oscar Buros, Ed., New Jersey: The Gryphon Press, 1978.

Albright, L. E. & Glennon, J. R. Personal history correlates of physical scientists' career aspirations. Journal of Applied Psychology, 1961, 45, 281-284.

Anastasi, A. Psychological Testing. New York: The Macmillan Company, 1968.

Anastasi, A., Meade, M. J. & Schneiders, A. A. The validation of a biographical inventory as a predictor of college success. Educational Testing Service, 1960, 80.

Anastasi, A. & Schaefer, C. E. Biographical correlates of artists and literary creativity of adolescent girls. Journal of Applied Psychology, 1969, 53, 267-273.

Anderson, L. Longitudinal changes in level of work adjustment. Unpublished doctoral dissertation, University of Minnesota, 1969.

Argyris, C. Personality and Organization Revisited. Administrative Science Quarterly, 1973, 18, 141-168.

Auclair, G. A. A personal history inventory for the selection of newspaper retail advertising salesmen. Unpublished doctoral dissertation, Purdue University, 1958.

Baehr, M. E. & Williams, G. B. Underlying dimensions of personal background data and their relationships to occupational classification. Journal of Applied Psychology, 1967, 51, 481-490.

Baehr, M. E. & Williams, G. B. Prediction of sales success from factorially determined dimensions of personal background data. Journal of Applied Psychology, 1968, 25, 98-103.

Barker, R. G. Ecological Psychology. Stanford, California: Stanford University Press, 1968.

Berdie, R. F. Factors associated with vocational interests. Journal of Educational Psychology, 1943, 34, 257-277.

REFERENCES (Continued)

Berdie, R. F. Range of interests and psychopathologies. *Journal of Clinical Psychology*, 1946, *2*, 161-166.

Betz, E. L. *Occupational reinforcer patterns and need-reinforcer correspondence in the prediction of job satisfaction.* Unpublished doctoral dissertation, University of Minnesota, 1968.

Biersner, R. & Ryman, J. Prediction of scuba training performance. *Journal of Applied Psychology*, 1974, *59*, 519-521.

Bohn, M.J., Jr., & Super, D. E. The computer in counseling and guidance programs. *Educational Technology*, 1969, *9*, 29-31.

Bordin, E. S. A theory of vocational interests as dynamic phenomena. *Educational Psychology Measurement*, 1943, *3*, 49-65.

Borgen, F., Weiss, D., Tinsley, H., Dawis, R., & Lofquist, L. The measurement of occupational reinforcer patterns. *Minnesota Studies in Vocational Rehabilitation*, 1968, *25*.

Brophy, A. Self, role, and satisfaction. *Genetic Psychology Monographs*, 1959, *59*, 263-308.

Brown, C. & Ghiselli, E. Factors related to the proficiency of motor coach operators. *Journal of Applied Psychology*, 1947, *31*, 477-479.

Buel, W. D. Biographical data and the identification of creative research personnel. *Journal of Applied Psychology*, 1965, *49*, 318-321.

Buel, W. D., Albright, L. E. & Glennon, J. R. A note on the generality and cross-validity of personal history for identifying creative research scientists. *Journal of Applied Psychology*, 1966, *50*, 217-219.

Campbell, D. Stability of interests within occupations over thirty years. *Journal of Applied Psychology*, 1966

Campbell, J. P. A monte-carlo approach to some problems inherent in multivariate prediction: with special reference to multiple regression. Technical Report, Personnel and Training Research Programs of Naval Research. Arlington, Virginia, 1974.

REFERENCES (Continued)

Carter, H. D. Vocational interests and job orientation. Applied Psychology Monographs, 1944, 2.

Chambers, J. A. Creative scientists of today. Science, 1964, 145, 1203-1205.

Chaney, F. B. & Owens, W. A. Life history antecedents of sales, research, and general engineering interests. Journal of Applied Psychology, 1964, 48, 101-105.

Clark, K. E. The vocational interests of nonprofessional men. Minneapolis, Minnesota: University of Minnesota Press, 1961.

Cleland, C. C. & Peck, R. F. Psychological determinants of tenure in institutional personnel. American Journal of Mental Deficiency, 1959, 64, 876-888.

Conover, W. J. Practical Nonparametric Statistics. New York: John Wiley & Sons, 1971.

Cooley, W. W. & Lohnes, P. R. Predicting Development in Young Adults. (Cooperative Research Project No. 3051) Project TALENT Office, 1966.

Crites, J. Revised list of psychological tests approved for use by the Veterans Administration. DVB Circular 21-68-8, Department of Veterans Benefits, Veterans Administration, May 22, 1968.

Cronbach, L. & Meehl, P. Construct validity in psychological tests. Psychological Bulletin, 1955, 52, 281-302.

Darley, J. G. & Hagenah, T. Vocational Interest Measurement: Theory and Practice. Minneapolis: University of Minnesota. 1955.

Dauw, D. C. Life experiences of original thinkers and good elaborators. Exceptional Children, 1966, 32, 433-440.

Dawis, R. V., Lofquist, L. H., & Weiss, D. J. A theory of work adjustment. Minnesota Studies in Vocational Rehabilitation, 1964, 15.

Dawis, R. V., England, G. W. & Lofquist, L. H. A theory of work adjustment. Minnesota Studies in Vocational Rehabilitation, 1968, 23.

REFERENCES (Continued)

Dawis, R. V. & Rounds, J. B. A comparison of need-reinforcer correspondence indices as predictors of job satisfaction. *Minnesota Studies in Vocational Rehabilitation*, 1975, *48*.

Downey, K., Hellriegel, Phelps, M. & Slocum, J. Organizational climate and job satisfaction: a comparative analysis. *Journal of Business Research,* 1974, *2*, 233-248.

Duff, L. & Siegel, L. Biographical factors associated with academic over and underachievement. *Journal of Educational Psychology*, 1957, *41*, 273-278.

Dunnette, M. D. Vocational interest differences among engineers employed in different functions. *Journal of Applied Psychology*, 1957, *41*, 273-278.

Dunnette, M. & Maetzold, J. Use of a weighted application blank in hiring seasonal employees. *Journal of Applied Psychology*, 1955, 39, 308-310.

Dyer, E., Cope, M., Monson, M. & Vandrimmelon, J. Can job performance be predicted from biographical, personality, and administrative climate inventories. *Nursing Research*, 1972, *21*, 294-304.

Edwards, A. L. *Manual: Edwards personal preference schedule*. New York: The Psychological Corporation, 1954.

England, G. W. *Development and Use of Weighted Application Blanks*. Industrial Relations Center, University of Minnesota, Minneapolis, Minnesota, 1971.

Fishman, J. A. & Pasanella, A. K. College admission selection studies. *Review of Educational Research*, 1960, *30*, 298-310.

Flanagan, J. C. Project TALENT: A national inventory of aptitudes and abilities. Pittsburgh: University of Pittsburgh, 1960.

Flanagan, J. C. & Jung, S. M. *Progress in education: A sample survey, (1960 - 1970*, Palo Alto: American Institutes for Research, 1971.

Flanagan, J. C., Dailey, J. T., Shaycoft, M. F., Gorham, W. A., Orr, D. B. & Goldberg, I. *Design for a Study of American Youth*. Boston: Houghton Mifflin Company, 1962.

REFERENCES (Continued)

Flanagan, J. C., Dailey J. T., Shaycoft, M. F., Orr, D. kB., Goldberg, I., & Neyman *The American High School Student*. Boston: Houghton-Mifflin Company: 1964.

Freeberg, N. E. The biographical blank as a predictor of student achievement: a review. *Psychological Reports*, 1967, *20*, 911-925.

Friedlander, R. & Margulies, N. Multiple impacts of organizational climate and individual value systems upon job satisfaction. *Personnel Psychology*, 1969, *22*, 171-183.

Gay, E., Weiss, D., Hendel, D., Dawis, R., & Lofquist, L. Manual for the Minnesota Importance Questionnaire. *Minnesota Studies in Vocational Rehabilitation*, *28*, 1971.

Golden, R. R. & Weiss, D. J. Relationship of vocational satisfaction to the correspondence of job reinforcement and vocational needs. Research Report No. 11, Work Adjustment Project, University of Minnesota, August, 1968. (mimeographed)

Goldsmith, D. B. The use of the personal history blank as a salesmanship test. *Journal of Applied Psychology*, 1922, *11*, 149-154.

Gray, B. L. A longitudinal study of extracurricular activities, vocational needs and individual vocational need stability during adolescence. "Doctoral Dissertation," University of Minnesota, 1974. *Dissertation Abstracts International*, 1974, *35*, 5082-b-5083-b.

Grigg, A. E. Childhood experience with parental attitudes: a test of Roe's hypotheses. *Journal of Counseling Psychology*, 1959, *6*, 153-156.

Guilford, J. P. *Psychometric Methods*. New York: McGraw-Hill Inc., 1954.

Guion, R. M. *Personnel Testing*, New York: McGraw-Hill, Inc., 1965.

Hagen, D. Careers and family atmosphere: a test of Roe's theory. *Journal of Counseling Psychology*, 1960, *7*, 251-256.

Hall, C. & Lindzey, G. *Theories of Personality*. New York: John Wiley & Sons, Inc., 1970.

REFERENCES (Continued)

Halpin, W. A study of the life histories and creative abilities of potential teachers. Dissertation Abstracts International, 1973, 33 (7-A), 3382.

Hardin, E. Perceived and actual change in job satisfaction. Journal of Applied Psychology, 1965, 49, 363-367.

Harshbarger, T. R. Introductory Statistics: A Decision Map. New York: The Macmillan Company, 1971.

Helmreich, R., Bakeman, R. & Roland, R. The life history questionnaire as a predictor of performance in navy diver training. Journal of Counseling Psychology, 1973, 57, 148-153.

Helson, R. Childhood interest clusters related to creativity in women. Journal of Consulting Psychology, 1965, 29, 352-361.

Helson, R. Personality of women with imaginative and artistic interests: the role of masculinity, originality, and other characteristics of their creativity. Journal of Personality, 1966, 34, 1-25.

Helson, R. Personality characteristics and developmental history of creative college women. Genetic Psychology Monographs, 1967, 76, 205-256.

Hendel, D. D. Behavioral validation of a self report measure of a vocational need dimension. Unpublished paper, Work Adjustment Project, University of Minnesota, 1973.

Hendel, D. D. & Weiss, D. J. A comparison of MIQ and AVL profiles for applied and theoretical psychology graduate students. Research Report No. 40, Work Adjustment Project, University of Minnesota, 1970.

Herzberg, F., Mauser, B., Peterson, R.V., & Capwell, D.F. Job Attitudes: Review of Research and Opinion. Pittsburg: Psychological Service of Pittsburgh, 1957.

Herzberg, F., Mausner, G. & Snyderman, B. The Motivation to Work. New York: John Wiley & Sons, Inc., 1959.

Holland, J. A theory of vocational choice. Journal of Counseling Psychology, 1959, 6, 35-54.

REFERENCES (Continued)

Holland, J. Creative and academic performances among talented adolescents. Journal of Educational Psychology, 1961, 52, 136-147.

Holland, J. Holland Vocational Preference Inventory, sixth revision. Palo Alto, California: Consulting Psychologists Press, 1965.

Holland, J. The Psychology of Vocational Choice. Waltham, Mass.: Blaisdell, 1966.

Holland, J. A Counselor's Guide for Use With the Self-Directed Search for Educational and Vocational Planning. Palo Alto, California: Consulting Psychologists Press, 1971.

Holland, J. C. & Astin, A. W. The prediction of the academic, artistic, scientific, and social achievement of undergraduates of superior scholastic aptitude. Journal of Educational Psychology, 1962, 53, 132-143.

Holland, J. C. & Nichols, R. C. Prediction of academic and extracurricular achievement in college. Journal of Educational Psychology, 1964, 55, 55-65.

Hoppock, R. Job Satisfaction. New York: Harper & Row, 1935.

Horst, P. Measuring complex attitudes. Journal of Social Psychology, 1935, 6, 369-374.

Hulin, C. Job satisfaction and turnover in a female clerical operation. Journal of Applied Psychology, 1966, 50, 280-285.

Jahoda, M. A social-psychological approach to the study of culture. Human Relations, 1961, 14, 23-30.

Johansson, C. B. & Campbell, D. P., Stability of the Strong Vocational Interest Blank for men. Journal of Applied Psychology, 1971, 487-90.

Kavanaugh, M. & York, D. Biographical correlates of middle managers' performance. Personnel Psychology, 1972, 25, 319-332.

Kendall, M. G., Rank Correlation Methods. London: Griffin, 1948.

Kirchner, W. & Dunnette, M. Applying the weighted application blank technique to a variety of jobs. Journal of Applied Psychology, 1957, 41, 206-208.

REFERENCES (Continued)

Klimoski, R. A biographical data analysis of career patterns in engineering. Journal of Vocational Behavior, 1973, 3, 103-113.

Kornhauser, A. Mental Health of the Industrial Worker. New York: John Wiley & Sons, Inc., 1965.

Kriedt, P. & Gudel, M. Prediction of turnover in clerical workers. Journal of Applied Psychology, 1953, 37, 338 -340.

Kuhlen, R. G. Needs, perceived needs satisfaction opportunities and satisfaction with occupation. Journal of Applied Psychology, 1963, 47, 56-64.

Kulberg, G. & Owens, W. Some life-history antecedents of engineering interests. Journal of Educational Psychology, 1960, 51, 26-31.

Lee, R. & Booth, J. A utility analysis of a weighted application blank designed to predict turnover for clerical employees. Journal of Applied Psychology, 1974, 59, 516-618.

Lichtman, C. & Hunt, R. Personality and organization theory: a review of some conceptual literature. Psychological Bulletin, 1971, 76, 271-294.

Lofquist, L. H. & Dawis, R. V. Adjustment to Work. New York: Appleton-Century-Crofts, 1969.

Lohnes, P. R., Measuring Adolescent Personality. (Cooperative Research Project No. 3051) Project TALENT Office, 1966.

MacKinnon, D. W. The nature and nurture of creative talent. American Psychologist, 1962, 17, 484-495.

McClelland, J. N. & Rhodes, F. Prediction of job successes for hospital aides and orderlies from MMPI scores and personal history data. Journal of Applied Psychology, 1969, 53, 49-54.

Meresman, J. F. Biographical correlates of vocational needs. Unpublished doctoral dissertation, University of Minnesota, 1975.

Morse, N. C. Satisfaction in the white-collar job. Ann Arbor, Michigan: University of Michigan Survey Research Center, 1953.

REFERENCES (Continued)

Mosel, J. N. & Wade, R. R. A weighted application blank for reduction of turnover in department store sales clerks. Personnel Psychology, 1951, 4, 177-184.

Mosier, C. I. Measurement in rural housing: a preliminary report. Educational and Psychological Measurement, 1942, 2, 139-152.

Murray, H. A. Explorations in Personality. New York: Oxford University Press, 1938.

Myers, R. Biographical factors and academic achievement: an experimental investigation. Educational and Psychological Measurement, 1952, 12, 415-426.

Nachmann, B. Childhood experiences and vocational choice in law, dentistry, and social work. Journal of Counseling Psychology, 1960, 7, 243-250.

Nichols, R. C. Parental attitudes of mothers of intelligent adolescents and creativity of their mothers. Child Development, 1964, 35, 1041-1050.

Owens, W. A. & Charles, D. C. Life history correlates of age changes in mental abilities. Research Project No. 1052, Purdue University, 1963.

Parsons, F. Choosing a Vocation. Boston: Houghton-Mifflin Company, 1909.

Pervin, L. A. A twenty-college study of student x college interaction using TAPE (transactional analysis of personality and environment): rationale, reliability, and validity. Journal of Educational Psychology, 1967, 58, 290-302.

Pervin, L. A. Performance and satisfaction as a function of individual-environment fit. Psychological Bulletin, 1968, 69, 56-68.

Pervin, L. A. & Rubin, D. B. Student dissatisfaction with college and college dropout: a transactional approach. Journal of Social Psychology, 1967, 72, 285-295.

Rabkin, L. J. The patient's family. In Winter, W. D. & Ferreira, A. J. (Ed.) Research in Family Interaction. Palo Alto: Science and Behavior Books, 1969.

REFERENCES (Continued)

Radloff, R. & Helmreich, R. Groups Under Stress. New York: Appleton-Century-Crofts, 1968.

Robinson, J. P., Athanasiou, R. & Head, K. Measures of Occupational Attitudes and Occupational Characteristics. Ann Arbor, Michigan: University Survey Research Center, 1969.

Roe, A. A psychological study of physical scientists. Genetic Psychology Monographs, 1951, 43, 121-239.

Roe, A. A psychological study of eminent psychologists and anthropologists, and a comparison with biologists and physical scientists. Psychology Monograph: General and Applied, 1953, No. 3 (Whole Number 352).

Roe, A. The Psychology of Occupations. New York: Wiley, 1956

Roe, A. Early determinants of vocational choice. Journal of Counseling Psychology, 1957, 4, 212-217.

Roe, A. Personality structure and occupational behavior. In Borrow, H. (Ed.) Man in a World of Work. Boston: Houghton-Mifflin Company, 1964.

Sarason, I. G. & Smith, R. E. Personality. Annual Review of Psychology, 1971, 22, 393-446.

Schaefer, C. E. Biographical inventory correlates of scientific and artistic creativity in adolescents. Dissertation Abstracts, 1967, 28 (3-B), 1173-1174.

Schaefer, C. E. The prediction of creative achievement from a biographical inventory. Educational and Psychological Measurement, 1969, 29 (1) 431-437.

Schaefer, C. E. Predictive validity of the biographical inventory of creativity: 5 year follow-up. Psychological Reports, 1972, 30, 471-476.

Schaefer, C. E. & Anastasi, A. Biographical inventory for identifying creativity in adolescent boys. Journal of Applied Psychology, 1968, 52, 42-48.

Schaffer, R. H. Job satisfaction as related to need satisfaction in work. Psychological Monographs, 1953, 67, (14, Whole Number 364).

REFERENCES (Continued)

Schneider, B. Organizational climate: individual preferences and organizational realities. Journal of Applied Psychology, 1972, 56, 211-218.

Schuh, A. J. The predictability of employee tenure: a review of the literature. Personnel Psychology, 1967, 20, 133-152.

Scollay, R. W. Validation of personality history items against a salary increase criterion. Personnel Psychology, 1956, 9, 325-336.

Sells, S. B. An interactionist looks at the environment. American Psychologist, 1963, 18, 696-702.

Smith, W. J., Albright, L. E., Glennon J. R. & Owens, W. A. The prediction of research competence and creativity from personal history. Journal of Applied Psychology, 1961, 45, 59-62.

Starishevsky, R. & Matlin, N. A model for the translation of self concepts into vocational terms. In Zytowski, D. G. (Ed.) Vocational Behavior: Readings in Theory and Research. New York: Holt, Rinehart and Winston, Inc., 1968.

Starks, D. The utilization of biographical information in the prediction of academic achievement. Unpublished doctoral dissertation, Perdue University, 1967.

Steger, J. Prediction of the stability of vocational needs in adult males: a methodological study. Unpublished doctoral dissertation, University of Minnesota, December 1972.

Sternberg, G. Interests and tendencies toward maladjustment in a normal population. Personnel Guidance Journal, 1956, 35, 94-99.

Strong, E. K., Jr. Vocational interests of men and women. Stanford University Press, 1943.

Strong, E. K., Jr. Vocational interests 18 years after college. Minneapolis: University of Minnesota Press, 1955.

Stulman, D. A. Experimental validation of the independence and creativity scales of the Minnesota Importance Questionnaire. Unpublished doctoral dissertation, University of Minnesota, 1974.

REFERENCES (Continued)

Super, D. E. Vocational interests and vocational choice: present knowledge and future research in their relationships. *Education Psychology Measurement*, 1947, *7*, 375-383.

Super, D. E. A theory of vocational development. *American Psychologist*, 1953, *8*, 185-190.

Super, D. E. *The Work Values Inventory*. Boston: Houghton-Mifflin, 1969

Super, D. E., Starishevsky, R., Matlin, N., & Jordaan, J. P. *Career Development: Self-concept Theory*. New York: College Entrance Examination Board, 1963.

Taylor, C. W. & Ellison, R. L. Biographical predictors of scientific performance. *Science*, 1967, *155*, 1075-1080.

Taylor, K. E. & Weiss, D. J. Prediction of individual job termination from measured job satisfaction and biographical data. *Journal of Vocational Behavior*, 1972, *2*, 123-132.

Thomson, R. W. *A factor analysis of the life history correlates of engineering interests*. Unpublished doctoral dissertation, Purdue University, 1964.

Thorndike, R. M., Weiss, D. J. & Dawis, R. V. Multivariate relationships between a measure of vocational interests and a measure of vocational needs. *Journal of Applied Psychology*, 1968 (a), *52*, 491-496.

Thorndike, R. M. Weiss, D. J. & Dawis, R. V. Canonical correlation of vocational interests and vocational needs. *Journal of Counseling Psychology*, 1968 (b), *15*, 101-106.

Tiffin, J., Parker, B. T. & Haberstart, R. U. The analysis of personnel data in relation to turnover on a factory job. *Journal of Applied Psychology*, 1947, *31*, 615-616.

Triggs, F. O. A further comparison of interest measurement by the Kuder Preference Record and the Strong Vocational Interest Blank for Men. *Journal of Education Research*, 1944, *37*.

Tyler, Leona E. *The Psychology of Human Differences*. New York: Appleton-Century-Crofts, 1956.

REFERENCES (Continued)

Utton, A. C. Recalled parent-child relations as determinants of vocational choice. Journal of Counseling Psychology, 1962, 9, 49-52.

Vessey, T. M. A longitudinal study of the prediction of job satisfaction as a function of the correspondence between needs and the perceptions of job reinforcers in an occupation. Unpublished doctoral dissertation, University of Minnesota, 1973.

Vroom, V. H. Some Personality Determinates of the Effects of Participation, Englewood Cliffs, N. J.: Prentice-Hall, 1960.

Vroom, V. H. Work and Motivation. New York: John Wiley and Sons, 1964.

Walsh, R. P. The effects of needs on response to job duties. Journal of Counseling Psychology, 1959, 6, 194-198.

Warnken, R. G. The educational background of male schizophrenic patients. Unpublished doctoral dissertation, University of Minnesota, 1957.

Warren, L. W. The prediction of job satisfaction as a function of the correspondence between vocational needs and occupational reinforcers. Unpublished doctoral dissertation, University of Minnesota, 1970.

Webb, S. C. The comparative validity of two biographical inventory keys. Journal of Applied Psychology, 1960, 44, 177-183.

Wechsler, H. & Pugh, T. F. Fit of individual and community characteristics and rates of psychiatric hospitalization. American Journal of Sociology, 1967, 73, 331-338.

Weiss, D. J. A technique for curvilinear multivariate prediction. Unpublished doctoral dissertation, University of Minnesota, 1963.

Weiss, D. J., Dawis, R. V., England, G. W., & Lofquist, L. H. Construct validation studies of the Minnesota Importance Questionnaire. Minnesota Studies in Vocational Rehabilitation, 1964, 18. (a)

Weiss, D. J., Dawis, R. V., England, G. W., & Lofquist, L. H. The measurement of vocational needs. Minnesota Studies in Vocational Rehabilitation, 1964, 16. (b)

REFERENCES (Continued)

Weiss, D. J., Dawis, R. V., England, G. W., & Lofquist, L. H. An inferential approach to occupational reinforcement. Minnesota Studies in Vocational Rehabilitation, 1965, 19.

Weiss, D. J., Dawis, R. V., England, G. W., & Lofquist, L. H. Instrumentation for the theory of work adjustment. Minnesota Studies in Vocational Rehabilitation, 1966, 21.

Weiss, D. J., Dawis, R. V., England, G. W., & Lofquist, L. H. Manual for the Minnesota Satisfaction Questionnaire. Minnesota Studies in Vocational Rehabilitation, 1967, 22.

Weiss, D. J. & Dawis, R. V. Multivariate prediction technique for problems involving multifunctional predictor-criterion relationships. Proceedings, 76th Annual Convention, American Psychological Association, 1968.

Welsh, P. The relationship between personal history characteristics and the decision to stay or leave teaching. Unpublished doctoral dissertation, University of Maryland, 1960.

Whelan, K. J. A BIB study of more creative and less creative occupations. Unpublished doctoral dissertation, Case Western Reserve, 1965.

Wilensky, H. L. Varieties of work experience. In Borrow, H. (Ed.), Man in a World at Work. Boston: Houghton-Mifflin, 1964.

Zedek, M. E, Minnesota Importance Questionnaire, in The Eighth Mental Measurements Yearbook, Oscar Buros, Ed., New Jersey: The Gryphon Press, 1978.

APPENDIX A

STUDENT INFORMATION BLANK

Directions: These questions are about yourself, your family, and your plans for the future. This is not a test, and there are no right or wrong answers. Answer each question sincerely and thoughtfully as it applies to you. In no way will your answers affect your grades in school. All answers are strictly confidential.

Answer every question. For each question you are to mark one answer and only one answer. Be sure to read each question carefully, and then mark your answer in the appropriate space on your answer sheet. Some of the questions may be difficult for you to answer. Do not spend too much time on these questions, but mark the one best answer, and go on to the next question. You should have enough time to answer all the questions if you move along steadily.

Part I: ACTIVITIES

Directions: The questions in this part are about things you have done. Answer each question sincerely and thoughtfully. Each question has one answer and only one answer. Answer every question even if you are not sure of your answer. Now, go ahead and answer the questions.

Organizations

Items 1-10. How active have you been in any one or more of the following organizations? Mark your answers as follows:

A. Extremely active
B. Very active
C. Fairly active
D. A member, but not very active
E. A member, but rarely active
F. Not a member of any of these organizations

1. School newspaper, magazine, or annual
2. School subject matter clubs, such as science, mathematics, language, or history clubs
3. Debating, dramatics, or musical clubs or organizations
4. Hobby clubs, such as photography, model building, hot rod, electronics, woodworking, crafts, etc.
5. Farm youth groups, such as 4-H club, Future Farmers of America, etc.
6. Church, religious, or charitable organizations, such as Catholic Youth of America, B'nai B'rith Youth Organization, Protestant youth group; organized non-school youth groups such as YMCA, YWCA, Hi-Y, Boy's Club, etc.

7. Informal neighborhood group
8. Political club, such as Young Democrats or Republicans
9. Social clubs, fraternities, or sororities
10. How many times have you been president of a class, a club, or other organization (other than athletic) in the last 3 years?

    A. None
    B. Once
    C. Twice
    D. Three times
    E. Four times
    F. Five or more times

11. How many times have you been an officer or committee chairman (other than president) of a class, a club, or other organization (other than athletic) in the last 3 years?

    A. None
    B. Once
    C. Twice
    D. Three times
    E. Four times
    F. Five or more times

12. How many times in the last 3 years have you been captain of an athletic team?

    A. None
    B. Once
    C. Twice
    D. Three times
    E. Four times
    F. Five or more times

Hobbies

Items 13-28. How often have you done any one or more of the following in the past 3 years? Include extracurricular activities at school, but do not include things done for school assignments. In each group of activities, answer for one or more in the group. Mark your answers as follows:

A. Very often
B. Often
C. Occasionally
D. Rarely
E. Never

13. Drawing, painting, sculpting, or decorating

14. Acting, singing, or dancing for a public performance
15. Collecting stamps, coins, rocks, insects, etc.
16. Building model airplanes, ships, trains, cars, etc.
17. Working with photographic equipment (do not include taking occasional snapshots)
18. Making jewelry, pottery, or leather work
19. Making or repairing electrical or electronic equipment
20. Cabinet making or woodworking
21. Metal working
22. Mechanical or auto repair
23. Raising or caring for animals or pets
24. Sewing, knitting, crocheting, or embroidering
25. Cooking
26. Playing baseball, football, or basketball
27. Gardening, raising flowers or raising vegetables
28. Hunting or fishing

Items 29-32. How often have you done any one or more of the following in the past 3 years? Mark your answers as follows:

A. Very often
B. Often
C. Occasionally
D. Rarely
E. Only once
F. Never

29. Attending concerts, lectures, plays (not motion pictures), ballet; visiting art galleries or museums
30. Playing golf or tennis; swimming
31. Playing hockey, lacrosse, or handball; boxing, wrestling, track, field events
32. Going bicycling, ice skating, skiing, canoeing, horseback riding

Work

33. On the average, how many hours a week do you spend doing chores around the house?

A. None
B. One to three
C. Four to six
D. Seven to nine
E. Ten to twelve
F. Thirteen or more

34. How old were you when you first started earning money? Do not count money earned for doing chores around your own home.

A. I have not done this.
B. 10 or younger
C. 11 or 12
D. 13 or 14
E. 15 or 16
F. 17 or older

35. How many summers have you had a regular job for which you were paid? Do not count money earned for doing chores around your own home.

A. None
B. One
C. Two
D. Three
E. Four
F. Five or more

36. During the school year, about how many hours a week do you work for pay? Do not include chores done around your own home.

A. None
B. About 1-5 hours
C. About 6-10 hours
D. About 11-15 hours
E. About 16-20 hours
F. About 21 hours or more

Items 37-45. How often have you done each of the following kinds of part-time or summer work for pay in the last 3 years? Mark your answers as follows:

A. Very often
B. Often
C. Occasionally
D. Rarely
E. Never

37. Delivering newspapers, baby-sitting, mowing lawns, house cleaning, etc.
38. Clerical work; typing, filing, etc.
39. Farm work or orchard work
40. Assistant in a science laboratory
41. Factory work
42. Retail store work; stockwork, delivery, clean up, etc.
43. Sales work
44. Camp counselor
45. Other work for pay

Items 46-49. What per cent of your spending money comes from each of these sources? Choose the closest answer. Mark your answers as follows:

A. 0 percent
B. 20 percent
C. 40 percent
D. 60 percent
E. 80 percent
F. 100 percent

46. Regular allowance
47. From family, as I need it
48. From a job
49. Some other source

Social

50. How old were you when you first went out on a date?

A. I have never had a date.
B. 12 or younger
C. 13 or 14
D. 15
E. 16
F. 17 or older

51. On the average, how many dates do you have in a week?

A. I never have dates.
B. About 1
C. About 2
D. About 3
E. About 4 or 5
F. About 6 or 7

52. During the school year, on what days are you usually permitted to go out in the evening for fun (until 8 P.M. or later)?

A. Saturdays only
B. Fridays and Saturdays only
C. Fridays, Saturdays, and Sundays only
D. Any day
E. Only for very special occasions
F. Never

53. How many times have you gone "steady" in the past three years?

A. None
B. Once
C. Twice
D. Three times
E. Four times
F. Five or more times

54. On the average, how many evenings a week during the school year do you go out for fun and recreation?

A. Less than one
B. One
C. Two
D. Three
E. Four or five
F. Six or seven

Reading

55. How many books have you read (not including those required for school) in the past 12 months? Don't count magazines or comic books.

A. None
B. 1 to 5
C. 6 to 10
D. 11 to 15
E. 16 to 20
F. 21 or more

Items 56-63. How many books or magazines have you read in each of the following groups (not including those required for school) in the past 12 months? Mark your answers as follows:

A. None
B. 1
C. 2
D. 3
E. 4
F. 5 or more

56. Western stories, adventure stories, or mystery stories (not comic books)
57. Science fiction books or magazines (not comic books)
58. Science--non-fiction
59. Plays, poetry, essays, literary criticism, or classics
60. Politics, world affairs, biography, autobiography, historical novels
61. Religious books or magazines
62. Comic books
63. Love stories

Studying

Items 64-89. For the following statements indicate how often each one applies to you. Please answer the questions sincerely. Your answers will not affect your grades in any way. Mark one of the following choices for each statement.

A. Almost always
B. Most of the time
C. About half the time
D. Not very often
E. Almost never

64. I do a little more than the course requires.
65. I have a difficult time expressing myself in written reports, examinations, and assignments.
66. Being a fast reader helps me complete my lessons quickly.
67. My grades reflect my ability fairly accurately.
68. I make sure that I understand what I am to do before I start an assignment.
69. I seem to accomplish very little compared to the amount of time I spend studying.
70. Lack of interest in my school work makes it difficult for me to keep my attention on what I am doing.
71. I enjoy writing reports or compositions.
72. Failure to pay attention in class has caused my marks to be lowered.
73. I consider a very difficult assignment a challenge to my abilities.
74. I do my assignments so quickly that I don't do my best work.
75. I have missed assignments or other important things that the teacher has said, because I was not paying attention.
76. My teachers have criticized me for turning in a sloppy assignment.
77. Unless I really like a course, I do only enough to get by.

Mark your choices as follows:

A. Almost always
B. Most of the time
C. About half the time
D. Not very often
E. Almost never

78. I have difficulty with the mechanics of English composition.

79. In class I can't seem to keep my mind on what the teacher is saying.
80. I get behind in my school assignments.
81. My grades on written examinations or reports have been lowered because of careless errors in spelling, grammar, or punctuation.
82. Slow reading holds me back in my school work.
83. I pronounce the words to myself as I am reading.
84. I feel that I am taking courses that will not help me much in an occupation after I leave school.
85. When studying for a test, I am able to pick out important points to learn.
86. I don't seem to be able to concentrate on what I read. My mind wanders and many things distract me.
87. I keep up to date on my assignments by doing my work every day.
88. I have trouble remembering what I read.
89. I read material over and over again without really understanding what I have read.

Schooling

90. Which one of the following high school programs or curriculums is most like the one that you are taking? If you have not yet been assigned to a program, which do you expect you will take?

    A. General - a program that does not necessarily prepare you either for college or for work, but in which you take subjects required for graduation and many subjects that you like.
    B. College Preparatory - a program that gives you the training and credits needed to work toward a regular Bachelor's degree in college.
    C. Business - a program that prepares you to work in an office; for example, as a secretary or accountant.
    D. Vocational - a program that prepares you to work in a shop or factory, or to enter a trade school, or become an apprentice after high school.
    E. Agriculture
    F. A program very different from the above.

91. How many times have you changed schools since starting the 1st grade (not counting promotions from one school to another)?

    A. Never
    B. Once

C. Twice
D. Three times
E. Four times
F. Five or more times

92. When was the last time you changed schools (not counting promotions from one school to another)?

A. I have not done this.
B. About one year ago
C. About two years ago
D. About three years ago
E. About four years ago
F. About five or more years ago

93. How old were you when you started the first grade?

A. Four years old or younger
B. Five years old
C. Six years old
D. Seven years old
E. Eight years old
F. Nine years old or older

94. Since you started the first grade, how many full semesters of school have you missed?

A. None
B. One semester
C. Two semesters
D. Three semesters
E. Four semesters
F. Five semesters or more

95. How many days were you absent from school in the last school year (September 1975 to June 1976)?

A. None
B. One to four days
C. Five to nine days
D. Ten to fourteen days
E. Fifteen to nineteen days
F. Twenty or more days

96. On the average, how many hours do you study each week? Include study periods in school as well as studying done at home.

A. None
B. About 1 - 4 hours per week

C. About 5 - 9 hours per week
D. About 10 - 14 hours per week
E. About 15 - 19 hours per week
F. About 20 or more hours per week

Items 97-103. Starting with courses taken in the ninth grade, how many semesters (half-years) of each of the following kinds of courses have you taken? Include those which you are taking now. Mark your answers as follows:

A. None
B. One or two
C. Three or four
D. Five
E. Six
F. Seven or more

97. Science courses (biology, chemistry, general science, physics, etc.)
98. Foreign languages (French, German, Spanish, Latin, etc.)
99. Social studies (history, civics, government, economics, etc.)
100. English courses (grammar, composition, literature, etc.)
101. Business courses (typing, including shorthand, business law, commercial arithmetic, etc.)
102. Vocational, shop, or agricultural courses
103. Mathematics courses (algebra, geometry, trigonometry, etc.) Do not count business mathematics or shop mathematics.
104. Has calculus been included in any mathematics course you have ever taken or are now taking?

A. No
B. Yes, for a period of about 2 weeks
C. Yes, for a period of about 1 month
D. Yes, for a period of about 2 months
E. Yes, for a period of about 3 months
F. Yes, for an entire semester

Items 105-112. The following questions ask you to report your grades in courses you have taken in the ninth grade or later. Please consider only semester grades. If you have not taken any courses in the topic, skip the item. In these questions choose the one answer that best describes your grades. Mark your answers as follows:

A. All A's or equivalent
B. Mostly A's or equivalent
C. Mostly A's or B's or equivalent

D. Mostly B's and C's or equivalent
E. Mostly C's and D's or equivalent
F. Mostly D's or below or equivalent

(If your school does not use letter grades, please use the following equivalents:

For a grade of A: Excellent; 90-100
For a grade of B: Good; 80-90
For a grade of C: Average; 70-79
For a grade of D: Fair; 60-70
For a grade below D: Failing; 59 or lower)

105. My grades in mathematics have been:
106. My grades in science courses have been:
107. My grades in foreign languages have been:
108. My grades in history and social studies courses have been:
109. My grades in English courses have been:
110. My grades in vocational courses have been:
111. My grades in business courses have been:
112. My grades in all courses starting with the ninth grade have been:

Guidance

Items 113-116. How many times have you discussed each of the following with your teachers or school principal in the past school year? Mark your answers as follows:

A. None
B. One
C. Two
D. Three
E. Four
F. Five or more

113. Colleges or college plans
114. Jobs or occupations after high school
115. Your high school work
116. Personal problems

Items 117-120. How many times have you discussed each of the following with your school counselor in the past school year? Mark your answers as follows:

A. We have no school counselor.
B. None
C. One
D. Two
E. Three
F. Four or more

117. Colleges or college plans
118. Jobs or occupations after high school
119. Your high school work
120. Personal problems

Items 121-128. How many times have you discussed your plans for after high school with each of the following people? Mark your answers as follows:

A. None
B. One
C. Two
D. Three
E. Four
F. Five or more

121. Father
122. Mother
123. Brother or sister
124. School counselor
125. Teachers, principal, or assistant principal (not the school counselor)
126. Clergyman (minister, priest, rabbi, etc.)
127. Friends my own age
128. An adult not listed above

Go on to the next part.

Part II: FAMILY AND HOME

Directions: The questions in this part are about you and your family. Each question has one answer and only one answer. Answer each question sincerely and thoughtfully.

Many of the questions in this part are about your parents. If you are not living with both of your parents answer these questions for your step-mother or step-father, guardian(s), or foster parent(s). Following is a list of examples of adults with whom you may be living.

Father and mother
Father and step-mother
Mother and step-father
Foster
Mother and adult male relative (grandfather, uncle, older brother, etc.)
Father and an adult female relative (grandmother, aunt, older sister, etc.)
Grandparents
Brother or sister

In other words, answer for the two adults who are responsible for you. If you live with only one adult who is responsible for you, skip the questions for the other person.

If you live in an institution, mark E in question 129 below and skip to Part III.

Now, go ahead and answer the questions.

129. Who is the breadwinner in your family, that is, who provides the main source of support?

A. Father
B. Male guardian or male relative
C. Mother
D. Female guardian or female relative
E. I live in an institution.
F. Someone not listed above

130. Does your father work for pay on more than one job?

A. No
B. Yes, two
C. Yes, three
D. Yes, four or more

131. Does your father direct or supervise the work of other people? If he works on more than one job, mark your answer for his most important job. If he is now out of work, or if he is retired, mark your answer for his last job.

A. No
B. Yes, a few people (up to 4 or 5 people)
C. Yes, many people (from 6 to 19 people)
D. Yes, very many people (20 to 49 people)
E. Yes, 50 people or more
F. I don't know.

132. As far as you know, which one of the following best describes your father's responsibility for money and property on his job? If he works on more than one job, answer the question for the most important one. If he is temporarily unemployed, or if he is retired, answer the question for his last job.

A. He is not in charge of any money or property.
B. He is in charge of small amounts of money or property such as daily cash receipts, merchandise, or a few tools or machines.

C. He is in charge of fairly large amounts of money, merchandise, or other property.
D. He is in charge of a great deal of money, merchandise, or property.
E. I don't know.

133. Has your mother worked for pay at any time in the last three years?

A. Yes, regular part-time work
B. Yes, occasional part-time work
C. Yes, regular full-time work
D. Yes, occasional full-time work
E. No
F. I don't know.

134. How long has your mother been working for pay?

A. She has not done this, or I don't know.
B. 1 year or less
C. More than 1 but less than 3 years
D. More than 3 but less than 5 years
E. More than 5 but less than 7 years
F. More than 7 years

135. What was your father's highest rank while in military service?

A. Enlisted man (not a non-commissioned officer)
B. Non-commissioned officer
C. Officer
D. He did not serve.
E. I don't know.

136. Were your parents born in the United States?

A. My father was born in the U.S. but my mother was not.
B. My mother was born in the U.S. but my father was not.
C. Both my parents were born in the U.S.
D. Both my parents were born outside the U.S.
E. I don't know whether my father or mother was born in the U.S.

Items 137-146. How active has your father been in any one or more of the following organizations? Mark your answers as follows:

A. Extremely active
B. Very active

C. Fairly active
D. A member, but not active
E. A member, but rarely active
F. Not a member of any of these organizations

137. Church or religious group, teaching Sunday school, or charity work.
138. School organizations, such as the school board, Parent-Teacher's Association, etc.
139. Political groups or organizations
140. Labor union or trade union activities
141. Business or professional association
142. Hobby groups, such as dramatics, band, arts, crafts, etc.
143. Sports club, team, or organization
144. Social groups (Elks, Moose, etc.)
145. Civic organizations (Rotary, Lions, Kiwanis, etc.)
146. Active military reserve unit or veterans' organization (American Legion, Veterans of Foreign Wars, etc.)

Items 147-156. How active has your mother been in any one or more of the following organizations? Mark your answers as before.

147. Church or religious group, teaching Sunday school, or charity work
148. School organizations, such as the school board, Parent-Teacher's Association, etc.
149. Political groups or organizations
150. Labor union or trade union activities
151. Business or professional association
152. Hobby groups, such as dramatics, band, arts, crafts, etc.
153. Sports club, team or organization
154. Social groups (Eastern Star, D.A.R., etc.)
155. Civic organizations (League of Women Voters, etc.)
156. Auxiliary of veterans' organization (American Legion, Veterans of Foreign Wars, etc.)

Items 157-165. How well does either of your parents speak each of the following languages? Mark your answers as follows:

A. Very fluently
B. Fluently
C. Fairly well
D. Not very well
E. Rather poorly
F. Doesn't speak this language

157. French
158. German

159. Italian
160. Spanish or Portuguese
161. Russian or Slavic
162. Hebrew or Yiddish
163. Scandinavian language (Danish, Swedish, or Norwegian)
164. Oriental language
165. Some other foreign language

166. How long have you lived in this community?

A. One year or less
B. More than 1 year, but not more than 3 years
C. More than 3 years, but not more than 5 years
D. More than 5 years, but not more than 10 years
E. More than 10 years, but not all my life
F. All my life

167. Which one of the following best describes the community in which you lived just before moving to this community?

A. I have lived in this community all my life.
B. In suburban areas, towns, or villages around a city
C. Inside a large city with 100,000 or more people
D. Inside a medium sized city with 25,000 to 100,000 people
E. In a small city or town with 2,500 to 25,000 people (not the suburban area of a city)
F. A farm or village with less than 2,500 people (not the suburban area of a city)

168. How many different houses or apartments (not counting vacations away from your regular home) has your family lived in, in the last three years?

A. One
B. Two
C. Three
D. Four
E. Five
F. Six or more

169. Which one of the following best describes the building in which you live?

A. A one-family house
B. A two-family house
C. A small apartment house (3 or 4 families)
D. A large apartment house (5 families or more)

E. A rooming house, hotel, or trailer
F. Something different from the above

170. If your family is renting your home or the place where you live, about how much money are they paying each month?

A. less than $100
B. $100 to $149
C. $150 to $199
D. $200 to $249
E. $250 or more
F. We have bought (or are buying) our own home.

171. If your family has bought (or is buying) your home, what is its present value?

A. under $20,000
B. $20,000 to $29,999
C. $30,000 to $39,999
D. $40,000 to $49,999
E. More than $50,000
F. We are renting our home

172. Please make the best estimate you can of your family's total income for last year (1975). Include money earned by both parents or anyone else in the household who worked.

A. less than $5,000
B. $5,000 to $9,999
C. $10,000 - $19,999
D. $20,000 - $29,999
E. $30,000 or more
F. I can't estimate this.

173. Which of the following best describes your family's finances?

A. Barely able to make a living
B. Have the necessities
C. Comfortable
D. Well-to-do
E. Wealthy
F. Extremely wealthy

174. From which one of the following sources does your family get most of its income?

A. Professional fees

B. Business profits (including profits from a farm)
C. Fixed salary (paid on a weekly, monthly, or yearly basis)
D. Wages (paid on an hourly or daily basis, and depending on the number of hours worked)
E. Commissions or royalties
F. Some other source, not mentioned above

175. How many books are in your home?

A. None, or very few (0-10)
B. A few books (11-25)
C. One bookcase full (26-100)
D. Two bookcases full (101-250)
E. Three or four bookcases full (251-500)
F. A room full -- a library (501 or more)

Items 176-185. How many of each of the following kinds of magazines do you get regularly at home (by subscription or purchased regularly)? Mark your answers as follows:

A. None
B. One
C. Two
D. Three
E. Four
F. Five or more

176. Women's magazines, homemaking magazines, or fashion magazines (such as Better Homes and Gardens, House Beautiful, Woman's Day, Vogue, Glamour, 1001 Decorating Ideas, Budget Decorating and Remodeling)
177. Men's magazines or sports magazines (such as Sports Afield, Sports Illustrated, Field and Stream, Esquire, Argosy, Men's Week)
178. Movie magazines, love stories, detective magazines (such as Modern Screen, Photoplay, True Story, T.V. Radio Mirror, True Confessions, Real Detective, Official Detective Stories, True Detective, Inside Detective)
179. Mechanics, electronics, aviation, or automobile magazines (such as Popular Mechanics, Popular Science Monthly, Automobile Quarterly, Road Test Magazine, Mechanix Illustrated, Motor Trend)
180. Farm magazines (such as Farm Journal, Progressive Farmer, Farm and Garden, Southern Living, Farmer's Digest, Today's Farmer)
181. News or pictorial magazines (such as Newsweek, Time, U.S. News and World Report, Grit)
182. Business magazines (such as Business Week, Nation's Business, etc.)

183. Opinion magazines (such as The Nation, The New Republic, the National Inquirer)
184. Professional or trade journals or magazines
185. Science fiction magazines (such as Galaxy, Science Fiction, etc.)

Items 186-188. How many of the following do you get regularly at home (by subscription or purchased regularly)?

186. Atlantic Monthly, Harpers, National Geographic, Fortune, New Yorker

   A. None
   B. One
   C. Two
   D. Three
   E. Four
   F. Five

187. Readers' Digest, Coronet

   A. None
   B. One
   C. Two

188. Parent's Magazine, Boy's Life, American Girl

   A. None
   B. One
   C. Two
   D. Three

Items 189-194. How many of the following articles are in your home?

189. Automatic washer, automatic clothes dryer, electric dishwasher, electric or gas refrigerator, vacuum cleaner, home food freezer (separate from refrigerator)

   A. None
   B. One
   C. Two
   D. Three
   E. Four
   F. Five, six or more

190. Telephone, television set, radio, phonograph

   A. None
   B. One or two

C. Three or four
D. Five or six
E. Seven or more

191. Sterling silverware, paintings, tapestries, wall-to-wall carpeting, ceiling-to-floor drapes

A. None
B. One
C. Two
D. Three
E. Four
F. Five or more

192. Musical instruments, hi-fi or stereophonic set, classical records, art equipment, photo developing equipment

A. None
B. One
C. Two
D. Three
E. Four
F. Five or more

193. Tennis racket, golf clubs, hunting equipment, skis, fishing equipment

A. None
B. One
C. Two
D. Three
E. Four
F. Five or more

194. A room of my own, my own study desk, a typewriter

A. None
B. One
C. Two
D. Three or more

195. How many hand tools (saw, pliers, wire cutters, hammer, wrench, drill, screwdriver, crow bar, etc.) are in your home?

A. Five or less
B. Six to ten
C. Eleven to fifteen
D. Sixteen to twenty
E. Twenty-one to twenty-five
F. Twenty-six or more

196. How many electrically operated power tools (saw, drill, sander, etc.) are in your home?

A. None
B. One
C. Two
D. Three
E. Four
F. Five or more

197. How many cars or station wagons does your family own? Do not include trucks. Include your own as well as any owned by your parents or brothers or sisters living in your home.

A. None
B. One
C. Two
D. Three
E. Four
F. Five or more

198. What year model is your family's newest car or station wagon? Do not include trucks.

A. 1968 or older
B. 1969 or 1970
C. 1971 or 1972
D. 1973 or 1974
E. 1975 or 1976
F. My family does not own a car or station wagon.

199. Are you a twin, triplet, or quadruplet?

A. No
B. Yes, I have a twin in this school.
C. Yes, I have a twin who is living, but not in this school.
D. Yes, I am one of triplets or quadruplets and one or more of the others are in this school.
E. Yes, I am one of triplets or quadruplets, but none of the others are in this school.

The next questions are about education after high school. Education after high school can be any one of the following:

Vocational Schools: such as schools for barbers, beauticians, electricians, mechanics, technicians, etc. The program may last from a few months to two or three years. Although these schools are sometimes called a college, for the purpose of this questionnaire think of them as Vocational Schools.

Business Schools: such as secretarial, stenotyping, or accounting schools. The program may last from a few months to two or three years. Although these schools are sometimes called a college, for the purpose of this questionnaire think of them as Business Schools.

Community College: a two-year college program

Four-year College: has programs leading to a degree, such as Bachelor of Arts, Bachelor of Science, Bachelor of Engineering, etc.

Items 200-204. For the following questions, mark your answers as follows:

A. I have no brothers or sisters.
B. None
C. One
D. Two
E. Three
F. Four or more

200. How many of your brothers or sisters dropped out of high school without graduating?
201. How many of your brothers or sisters have ever attended a vocational school?
202. How many of your brothers or sisters have ever attended a business school?
203. How many of your brothers or sisters have ever attended a community college?
204. How many of your brothers or sisters have ever attended a four-year college?

Part III

Directions: The questions in this part are similar to those in some of the earlier parts. Answer each question sincerely and thoughtfully. Each question has one answer and only one answer.

Some of these questions are again about your parents, or the heads of your household. If you live in an institution, skip to question 209. Now, go ahead and answer the questions.

205. Which one of the following comes closest to describing the work of your father (or the male head of your household)? Mark only one answer. If he works on more than one job, mark the one on which he spends most of his

time. If he is now out of work, or if he's retired, mark the one that he did last.

A. Farm or ranch owner and/or manager
B. Farm or ranch foreman
C. Farm or ranch worker
D. Workman or laborer -- such as factory or mine worker, fisherman, filling station attendant, longshoreman, etc.
E. Private household worker -- such as a servant, butler, etc.
F. Protective worker -- such as a policeman, detective, sheriff, fireman
G. Service worker -- such as a barber, beautician, waiter, etc.
H. Semi-skilled worker -- such as factory machine operator, bus or cab driver, meat cutter, etc.
I. Skilled worker or foreman -- such as a baker, carpenter, electrician, enlisted man in the armed forces, mechanic, plumber, plasterer, tailor, foreman in a factory or mine (but not on a farm), etc.
J. Clerical worker -- such as bank teller, bookkeeper, sales clerk, office clerk, mail carrier, messenger, etc.
K. Salesman -- such as real estate or insurance salesman, factory representative, etc.
L, Manager -- such as sales manager, store manager, office manager, business manager, factory supervisor, etc.
M. Official -- such as manufacturer, officer in a large company, banker, government official or inspector, etc.
N. Proprietor or owner -- such as owner of a small business, wholesaler, retailer, contractor, restaurant owner, etc.
O. Professional -- such as actor, accountant, artist, clergyman, dentist, engineer, lawyer, librarian, scientist, etc.
P. Technical -- such as draftsman, surveyor, medical or dental technician, etc.
Q. I don't know.

206. If your father (or the male head of your household) has a professional or technical occupation (that is, if you marked O or P in the preceding question), answer this question. If your father does not have a professional or technical occupation, mark A on your answer sheet and go on to the next question.

Which one of the following professional or technical occupations comes closest to describing your father's occupation?

A. My father has an occupation other than professional or technical.
B. Accountant or auditor
C. Actor, musician, entertainer
D. Architect
E. Armed forces officer
F. Artist, designer, sculptor
G. Biological scientist
H. Chemist
I. College administrator
J. Clergyman
K. Dentist
L. Draftsman
M. Economist
N. Editor or reporter
O. Elected or appointed officer -- mayor, senator, judge, etc.
P. Engineer -- aeronautical, civil, chemical, electrical, mechanical, etc.
Q. Lawyer (not elected or appointed official)
R. Librarian
S. Mathematician
T. Nurse
U. Optometrist, osteopath, chiropractor, pharmacist
V. Physician or surgeon
W. Physicist
X. Psychologist
Y. Sociologist
Z. Social or welfare worker
AA. Statistician
BB. Surveyor
CC. Teacher, elementary school
DD. Teacher, high school
EE. Technician, medical or dental
FF. Veterinarian
GG. A technical occupation not listed above
HH. A scientific occupation not listed above
II. A professional occupation not listed above

207. Which one of the following comes closest to describing the work of your mother (or the female head of your household)? Mark only one answer. If she does housework in addition to outside work, count only the outside work. If she works on more than one job, mark the most important one. If she usually works, but is now out of work, mark the one that she did last.

A. Housewife only; she has not worked for pay in the last three years.
B. Farm or ranch owner and/or manager
C. Farm or ranch worker
D. Worker or laborer -- such as laundry worker, etc.
E. Private household worker -- such as housekeeper, maid, laundress, etc.
F. Protective worker -- such as policewoman, etc.
G. Service worker -- such as beautician, waitress, etc.
H. Semi-skilled worker -- such as factory machine operator, cab driver, etc.
I. Skilled worker or forewoman -- such as baker, inspector, etc.
J. Clerical worker -- such as bookkeeper, secretary, typist, sales clerk, store clerk, etc.
K. Sales -- such as real estate, life insurance, etc.
L. Manager -- such as sales manager, store manager, office manager, business manager, factory supervisor, etc.
M. Official -- such as manufacturer, officer in a large company, banker, government official or inspector, etc.
N. Proprietor or owner -- such as owner of a small business, wholesaler, retailer, restaurant owner, etc.
O. Professional -- such as actress, accountant, artist, dentist, physician, engineer, lawyer, librarian, scientist, etc.
P. Technical -- such as draftsman, medical or dental technician, etc.
Q. I don't know.

208. If your mother (or the female head of your household) has a professional or technical occupation (that is, if you marked O or P in the preceding question), answer this question. If your mother does not have a professional or technical occupation, mark A on your answer sheet and go on to the next question.

Which one of the following professional or technical occupations comes closest to describing your mother's occupation?

A. My mother has an occupation other than professional or technical.
B. Accountant or auditor
C. Actress, musician, entertainer

D. Architect
E. Artist, designer, sculptress
F. Biological scientist
G. Chemist
H. College administrator
I. Clergywoman
J. Dentist
K. Draftsman
L. Economist
M. Editor or reporter
N. Elected or appointed officer -- mayor, senator, judge, etc.
O. Engineer -- aeronautical, civil, chemical, electrical, mechanical, etc.
P. Lawyer (not elected or appointed official)
Q. Librarian
R. Mathematician
S. Nurse
T. Optometrist, osteopath, chiropractor, pharmacist
U. Physician or surgeon
V. Physicist
W. Psychologist
X. Sociologist
Y. Social or welfare worker
Z. Statistician
AA. Surveyor
BB. Teacher, elementary school
CC. Teacher, high school
DD. Technician, medical or dental
EE. A technical occupation not listed above
FF. A technical occupation not listed above
GG. A scientific occupation not listed above
HH. A professional occupation not listed above

Part IV

Directions: The questions in this part are similar to those in some of the earlier parts. Answer each question sincerely and thoughtfully. Each question has one answer and only one answer.

Some of these questions are again about your parents or the heads of your household. If you live in an institution, skip to question 223.

209. For whom does your father work? Mark only one answer. If he works on more than one job, mark the most important one. If he is now out of work, or if he is retired, mark the one that was his last employer.

A. A large company or industry
B. A small local company or industry
C. A retail business
D. An individual employer
E. He is self-employed.
F. The local or community government
G. A school or college
H. Military services
I. The state or national government (except military services or schools)
J. I don't know.

210. For whom does your mother work? Mark only one answer. If she works on more than one job, mark the most important one. If she is now out of work, mark the one that was her last employer.

A. A large company or industry
B. A small local company or industry
C. A retail business
D. An individual employer
E. The local or community government
F. A school or college
G. The state or national government (except schools)
H. She is self-employed.
I. Housewife only; she has not worked for pay in the last 3 years.
J. I don't know.

211. How old is your father?

A. 29 or younger
B. 30-34
C. 35-39
D. 40-44
E. 45-49
F. 50-54
G. 55-59
H. 60-64
I. 65 or older
J. I don't know.

212. How old is your mother?

A. 29 or younger
B. 30-34
C. 35-39
D. 40-44
E. 45-49

F. 50-54
G. 55-59
H. 60-64
I. 65 or older
J. I don't know.

213. In which branch of the military service did your father serve? If he served in more than one, mark the one in which he served the longest time.

A. Army
B. Navy
C. Air Force
D. Marine Corps
E. Coast Guard
F. He served in the Merchant Marine instead of the armed forces.
G. He did not serve.
H. He served, but I don't know in which branch.

214. Mark the one answer indicating the highest level of education your father reached. Mark the one best answer even if you are not sure.

A. None, or some grade school
B. Completed grade school
C. Some high school, but did not graduate
D. Graduated from high school
E. Vocational or business school after high school
F. Some junior or regular college, but did not graduate.
G. Graduated from a regular 4-year college
H. Master's degree
I. Some work toward doctorate or professional degree
J. Completed doctorate or professional degree
K. I don't know.

215. Mark the one answer indicating the highest level of education your mother reached. Mark the one best answer even if you are not sure.

A. None, or some grade school
B. Completed grade school
C. Some high school, but did not graduate
D. Graduated from high school
E. Vocational or business school after high school
F. Some junior or regular college, but did not graduate
G. Graduated from a regular 4-year college

H. Master's degree
I. Some work toward doctorate or professional degree
J. Completed doctorate or professional degree
K. I don't know.

216. With whom are you now living; this is, who are the heads of the house?

A. Mother and father
B. Mother only
C. Father only
D. Sometimes with my mother, sometimes with my father
E. Mother and stepfather
F. Father and stepmother
G. Grandparents, aunt, uncle, or cousins
H. Brother or sister
I. Foster parents (not relatives)
J. Someone not listed above

217. What is the total number of living children in your family? Include yourself, together with all full brothers and sisters, half-brothers and sisters, stepbrothers and sisters, and foster brothers and sisters. Include those not now living in your home.

A. One
B. Two
C. Three
D. Four
E. Five
F. Six
G. Seven
H. Eight
I. Nine
J. Ten
K. Eleven
L. Twelve or more

218. How many of your brothers, half-brothers, foster brothers, or stepbrothers are older than you? Do not count your own twin brother.

A. None
B. One
C. Two
D. Three
E. Four
F. Five

G. Six
H. Seven
I. Eight
J. Nine
K. Ten
L. Eleven or more

219. How many of your sisters, half-sisters, foster sisters, or stepsisters are older than you? Do not count your own twin sister.

A. None
B. One
C. Two
D. Three
E. Four
F. Five
G. Six
H. Seven
I. Eight
J. Nine
K. Ten
L. Eleven or more

220. Where did you live just before moving to this community?

A. I have lived here all my life.
B. New England states (Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut)
C. Middle Atlantic states (New York, New Jersey, Pennsylvania)
D. South Atlantic states (Delaware, Maryland, District of Columbia, Virginia, West Virginia, North Carolina, South Carolina, Georgia, Florida)
E. East North Central states (Ohio, Indiana, Illinois, Michigan, Wisconsin)
F. West North Central states (Minnesota, Iowa, Missouri, North Dakota, South Dakota, Nebraska, Kansas)
G. East South Central states (Kentucky, Tennessee, Alabama, Mississippi)
H. West South Central states (Arkansas, Louisiana, Oklahoma, Texas)
I. Mountain states (Montana, Idaho, Wyoming, Colorado, New Mexico, Arizona, Utah, Nevada)
J. Pacific states (Washington, Oregon, California, Hawaii, Alaska)

K. United States possessions (Puerto Rico, Guam, etc.)
L. In a foreign country.

221. How many rooms are in your home? Count all rooms: bedrooms, bathrooms, kitchen, living room, dining room, recreation room, enclosed porch, etc.

A. One
B. Two
C. Three
D. Four
E. Five
F. Six
G. Seven or eight
H. Nine or ten
I. Eleven or twelve
J. Thirteen or fourteen
K. Fifteen or sixteen
L. Seventeen or more

222. How many people live in your home? Include yourself, brothers, sisters, parents, relatives, boarders, roomers, servants, etc.

A. Two
B. Three
C. Four
D. Five
E. Six
F. Seven
G. Eight
H. Nine
I. Ten
J. Eleven
K. Twelve
L. Thirteen or more

223. How tall are you? Choose the closest one.

A. 4 feet 5 inches or less
B. 4 feet 6 inches to 4 feet 8 inches
C. 4 feet 9 inches to 4 feet 11 inches
D. 5 feet 0 inches to 5 feet 2 inches
E. 5 feet 3 inches to 5 feet 5 inches
F. 5 feet 6 inches to 5 feet 8 inches
G. 5 feet 9 inches to 5 feet 11 inches
H. 6 feet 0 inches to 6 feet 2 inches
I. 6 feet 3 inches to 6 feet 5 inches
J. 6 feet 6 inches or more

224. How much do you weigh? Choose the closest one.

- A. 74 pounds or less
- B. 75-89 pounds
- C. 90-104 pounds
- D. 105-119 pounds
- E. 120-134 pounds
- F. 135-149 pounds
- G. 150-164 pounds
- H. 165-179 pounds
- I. 180-194 pounds
- J. 195-209 pounds
- K. 210-224 pounds
- L. 225 pounds or more

225. How old were you when you learned social dancing?

- A. I never learned to dance.
- B. 9 or younger
- C. 10
- D. 11
- E. 12
- F. 13
- G. 14
- H. 15
- I. 16
- J. 17
- K. 18 or older

226. How many athletic teams have you been a member of in the last 3 years? Count intra-mural, church, school, and other teams.

- A. None
- B. One
- C. Two
- D. Three
- E. Four
- F. Five
- G. Six
- H. Seven
- I. Eight
- J. Nine
- K. Ten
- L. Eleven or more

227. How many clubs or organizations (other than athletic) have you belonged to in the last 3 years?

- A. None

B. One
C. Two
D. Three
E. Four
F. Five
G. Six
H. Seven
I. Eight
J. Nine
K. Ten
L. Eleven or more

Part V

Directions: The questions in this part are about your health. Each question has one answer and only one answer. Answer every question. Now, go ahead and answer the questions.

Health

228. How many different times have you been sick in bed (as much as a day) in the past year?

A. None
B. One or two
C. Three or four
D. Five or six
E. Seven or eight
F. Nine or more

229. What is the longest period of time that you have ever been in bed for sickness or an accident?

A. Up to one week
B. Up to one month
C. Up to three months
D. Up to six months
E. Up to one year
F. More than one year

230. Which one of the following best describes your usual health in the last three years?

A. Excellent
B. Very good
C. Good
D. Average
E. Poor
F. Very poor

231. Which one of the following best describes your usual health before you were ten years old?

A. Excellent
B. Very good
C. Good
D. Average
E. Poor
F. Very poor

232. How many times have you been treated by a doctor (outside of school) for illness, injury or an accident in the past six months?

A. None
B. One
C. Two
D. Three
E. Four
F. Five or more

233. On the average, about how many hours do you sleep each night?

A. About six or less
B. About seven
C. About eight
D. About nine
E. About ten
F. About eleven or more

234. How late do you usually stay up on weekends?

A. 9 p.m. or earlier
B. 10 p.m.
C. 11 p.m.
D. 12 midnight
E. 1 a.m.
F. 2 a.m. or later

Items 235-270. For the following questions, mark your answers as follows:

A. Yes
B. No

235. Do you wear glasses all the time?
236. Do you have trouble seeing things from a distance?
237. Do you wear glasses for special purposes (reading, TV, etc.)?

238. Do you have trouble hearing people talk?
239. Are you hard of hearing?
240. Do you wear a hearing aid?
241. Are you able to speak clearly all of the time?
242. Is your speech easily understood?
243. Do you have more trouble with your skin than others your own age?
244. Do you have more trouble with the skin on your face than others your own age?
245. Have you ever been knocked unconscious?
246. Do you have normal use of both your legs?
247. Do you have normal use of both your arms?
248. Do you have normal use of both your hands?
249. Do you have trouble with your back or spine?
250. Do you have frequent stomach trouble or indigestion?
251. Have you ever worn a shoulder brace, corrective shoes, leg brace, or any other appliance?
252. Have you ever had mumps?
253. Have you ever had rheumatic fever?
254. Have you ever had asthma?
255. Have you ever had hay fever?
256. Has a doctor ever told you that you have an allergy?
257. Has a doctor ever told you that you have heart trouble?
258. Have you ever had infantile paralysis (polio)?
259. Have you had frequent sore throats?
260. Have you ever had severely aching joints?
261. Do you often get severe headaches?
262. Have you ever had spells of dizziness and faintness?
263. Do you often get aches and pains even when you are not sick enough to see a doctor?
264. Do you catch colds very often?
265. Do you have trouble getting rid of a cold?

Items 266-270. For health reasons are you required to do the following:

266. Follow a special diet as prescribed by a doctor?
267. Get more sleep than others your age?
268. Avoid too much physical exertion or strenuous exercise?
269. Take special exercises?
270. Take medicine or pills prescribed by a doctor?

Awards

Items 271-278. For each of the following, how many awards or competitions have you won since you started the ninth grade? Do not include awards or competitions which include only a single class or grade in school. Count activities which were on a school, city-wide, state-wide, or national level. Mark your answers as follows:

A. None
B. One
C. Two
D. Three
E. Four
F. Five or more

271. Science
272. Mathematics
273. Foreign languages
274. Writing, debate, or oratory
275. Art
276. Music
277. Athletics
278. Activities, such as student government, Boy Scouts, Girl Scouts, YMCA, YWCA, etc.

Driving

279. How old were you when you learned to drive a car?

A. I do not know how to drive a car.
B. 13 or younger
C. 14
D. 15
E. 16
F. 17 or older

280. About how many times in the past 6 months have you driven or ridden on a motorcycle?

A. None
B. About 1 to 4 times
C. About 5 to 9 times
D. About 10 to 19 times
E. About 20 to 29 times
F. About 30 times or more

281. On the average, how many times a week during the past school year have you driven a car (for purposes other than work)? Count evening dates and driving to school as separate occasions.

A. None
B. Less than one time, on the average
C. One or two times
D. Three to five times
E. Six to nine times
F. Ten or more times

282. Do you have a car of your own, or one that is mostly for your use?

A. Yes
B. No

283. Did you take driver training at school?

A. Yes
B. No, this course is not available
C. No, although the course is available
D. No, but I expect to take the course in a latter grade.

This is the end of the Student Information Blank. If there is time left and you need to go back and work on any part of this booklet, you may do so.

APPENDIX B

EXHIBIT 1

September 1, 1976

____
____
____
____

Dear ________________:

Thank you for requesting additional information regarding the ______________ (Project TALENT follow-up study, Career Exploration Study?). We would greatly appreciate your cooperation with this research effort.

The purpose of this study, which we plan to conduct in __________, is to explore the origins and development of vocational needs and values. As you know, research has shown that needs and values are important factors in career development and job satisfaction. Research is needed to find out what developmental factors are associated with needs and values. The research we propose will not only enable us to meet this research need but will also allow us to add a new prespective on needs and values to the coverage of Project TALENT. *(Some statement of relationship of this research to Project TALENT? In other words, who approved it and who supports it?)

If you agree to participate, two questionnaires will be administered to the present (Appropriate Grade (s)) students: The Minnesota Importance Questionnaire (MIQ), a carefully constructed measure of vocational needs and values, and the Student Information Blank (SIB), one of the Project TALENT instruments which we use to obtain information on the student's status, background, and past experiences (copies enclosed?). The MIQ requires only 20-30 minutes to complete, while the SIB can be completed in 60 minutes. Total administration time should not exceed two hours.

An individual interpretative report of needs and values will be made for each student participant and mailed back to each participating school. These reports should be helpful in career planning with students and in increasing student self-knowledge.

Should you have questions or require additional information, please feel free to contact ______________ at any time. We sincerely hope you will decide to participate in this study.

Yours truely,

____

____

*Mrs. Fruehling - Some of the people who requested additional information were anxious to know how this study relates to Project TALENT. If we could provide them with more information regarding the origins of this study and the fact that Dr. Flanagan supports it, it would be helpful.

EXHIBIT 2

PROJECT PREDICT GENERAL INFORMATION REPORT

(To be completed by the test coordinator and returned with the questionnaire sets.)

Official name of school ____________________

Mailing address ____________________

____

____________________ zip

Telephone number ____________________

area code number

Name of test coordinator ____________________

---

1. Which grade participated in the study? (Check as many as apply.)

8	9	10	11
( )	( )	( )	( )

2. What is the number of questionnaire sets that were completed at each grade level? (Enter a number for each participating grade.)

8	9	10	11
___	___	___	___

3. Were the questionnaires administered to: (Check as many as apply.)

( ) large groups (groups of more than 30 students)
( ) Small groups (groups of fewer than 30 students)
( ) one student at a time
( ) Other (please specify) ____________________

4. Were the two questionnaires administered at: (Check as many as apply.)

( ) one sitting
( ) two sittings
( ) more than two sittings
( ) other (please specify) ____________________

5. How were test subjects selected? (Check only one.)

( ) randomly by individual student
( ) randomly by class
( ) the entire grade(s) was tested
( ) other (please specify) ____________________

6. How would you characterize the area in which the students in the test sample live?

( ) inner city
( ) urban (not inner city)
( ) suburban
( ) rural

7. Please indicate the percentage of students in the test sample whose ethnic background can be classified as:

______Black
______Mexican
______Puerto Rican
______Cuban
______Oriental
______White
______Other
100% Total

8. a. In your opinion, can the test sample be called "representative" of the entire grade(s) in your school?

( ) Yes ( ) No

b. If you answered "no" to 8.a., why?________________________
____

9. a. To the best of your knowledge, were there any problems or other circumstances that would cause you to question the reliability of these test results?

( ) Yes ( ) No

b. If you answered "yes" to 9.a., please specifiy.___________
____

10. Do you have any additional comments you wish to make about the testing?

____

____

____

THANK YOU FOR YOUR COOPERATION

EXHIBIT 3

September 28, 1976

____
____
____
____

Dear ______________________:

Thank you for agreeing to participate in the Project PREDICT study. Your cooperation with this research effort is greatly appreciated.

Two questionnaires will be sent to your school, no later than the middle of October, to be administered to a representative sample of XXX present XXth grade and XXX present XXth grade students. When the questionnaires have been completed and returned in the envelopes provided, we will have them scored and analyzed. Individual interpretative reports of needs and values will be made for each student and mailed back to each of the participating schools. These reports should be helpful in career planning with your students and increasing student self-knowledge.

Enclosed please find a pamphlet which explains the purpose and the format of the Minnesota Importance Questionnaire (MIQ). Complete instructions dealing with the administration of the MIQ and of the Student Information Blank (SIB) will accompany the package of questionnaires to be sent to your school.

Once again, thank you for your decision to participate.

Yours truly,

Robert M. Resnick
Research Associate

Enclosure

EXHIBIT 4

Apartment 506
10501 Cedar Lak Road
Minnetonka, Minnesota 55343
September 28, 1976

____
____
____
____

Dear ______________:

The State of New Jersey (Division of Vocational Education) recently agreed to financially support my proposed research project entitled "A Longitudinal Study of Life History Correlates of Vocational Needs and Values". The code name of this research effort is Project Predict.

I intend to explore the origin and development of vocational needs and values by administering two questionnaires to the participating students: The Minnesota Importance Questionnaire (MIQ), a carefully constructed measure of vocational needs and values, and the Student Information Blank (SIB), a revision of the instrument used by Project TALENT to obtain information on the student's background and past experiences. Dr. John C. Flanagan, chief experimenter of Project TALENT, is supporting this research effort because it will enable us to add a new perspective to the findings of his own ongoing national research project.

Since New Jersey schools were not included when the original group of subjects was drawn from the Project TALENT pool, I would like to include some New Jersey schools in my study. Dr. Joseph F. Kelly, a member of the Division of Vocational Education staff in the State of New Jersey, suggested that I contact you regarding your participation in this study.

I will be in phone contact with you, no later than October 1, with respect to the possibility of including a group of your 8th and/or 9th grade students in this upcoming study.

Yours truely,

Rosemary T. Fruehling
Project Director

EXHIBIT 5

CONFIRMATION LETTER FOR SCHOOLS AGREEING TO PARTICIPATE

October 8, 1976

____
____
____
____

Dear ______________:

Thank you for agreeing to participate in the Project PREDICT study. Your cooperation with this research effort is greatly appreciated.

Two questionnaires will be sent to your office no later than the middle of October, to be administered to a representative sample of 100 present 8th grade and 100 present 9th grade students. When the questionnaires have been completed and returned in the envelopes provided, we will have them scored and analyzed. Individual interpretative reports of needs and values will be made for each student and mailed back to each of the participating schools. These reports should be helpful in career planning with your students and in increasing student self-knowledge.

Enclosed please find a pamphlet which explains the purpose and the format of the Minnesota Importance Questionnaire (MIQ). Complete instructions dealing with the administration of the MIQ and of the Student Information Blank (SIB) will accompany the package of questionnaires to be sent to your school.

Once again, thank you for your decision to participate.

Cordially yours,

Rosemary T. Fruehling
Project Director

Enclosure

EXHIBIT 6

THANK YOU LETTER MAILED TO SCHOOLS HAVING RETURNED MATERIAL

November 29, 1976

____
____
____
____

Dear ______________:

Thank you for participating in Project PREDICT. I received you completed materials and am awaiting returns from a few more schools before beginning to analyze the overall data.

By early February you will receive the results of the Minnesota Importance Questionnaire (MIQ) for each of your participating students. These reports should help your students develop important insights into their own needs and values which will be extremely useful as they engage in their career choice endeavors.

As a small token of my appreciation, I plan to sent you an abstract of the completed study whose findings will involve a national sample of more than 3,000 students. These findings may reveal some of the life history items that are the best indicators of your students' vocational needs and values.

As the final effort on your part, I would greatly appreciate it if the test coordinator at your school would take a few minutes to complete the enclosed General Information Questionnaire. A stamped, self-addressed envelope is provided for returning the questionnaire.

Again, please accept my most sincere thanks for participating in this national study.

Cordially yours,

Rosemary T. Fruehling
Project Director

Enclosures

EXHIBIT 7

THANK YOU LETTER MAILED TO SCHOOLS NOT HAVING RETURNED MATERIAL

November 29, 1976

____
____
____
____

Dear ______________:

Thank you for agreeing to participate in Project PREDICT. I am awaiting your completed materials before I begin to analyze the overall data.

By early February you will receive the results of the Minnesota Importance Questionnaire (MIQ) for each of your participating students. These reports should help your students develop important insights into their own needs and values which will be extremely useful as they engage in their career choice endeavors.

As a small token of my appreciation, I plan to sent you an abstract of the completed study whose findings will involve a national sample of more than 3,000 students. These findings may reveal some of the life history items that are the best indicators of your students' vocational needs and values.

As the final effort on your part, I would greatly appreciate it if the test coordinator at your school would take a few minutes to complete the enclosed General Information Questionnaire. A stamped, self-addressed envelope is provided for returning the questionnaire.

Again, please accept my most sincere thanks for participating in this national study. I look forward to receiving your materials.

Cordially yours,

Rosemary T. Fruehling
Project Director

Enclosures

APPENDIX C

ACRONYMS

Acronym	Item Number	Response Letter	Response That It Represents
PROFEE	174	A	Professional fees.
FIXSAL	174	C	Fixed Salary (paid on a weekly, monthly, or yearly basis).
WAGE	174	D	Wages (paid on an hourly or daily basis, and depending on the number of hours worked).
COMROY	174	E	Commissions or royalties.
OTSOUR	174	F	Some other source, not mentioned above.
FARM	205	A	Farm or ranch owner and/or manager.
		B	Farm or ranch foreman.
		C	Farm or ranch worker.
	207	B	Farm or ranch owner and/or manager.
		C	Farm or ranch worker.
LABOR	205	D	Workman or laborer--such as a factory or mine worker, fisherman, filling station attendant, longshoreman, etc.
	207	D	Worker or laborer--such as a laundry worker, etc.
SERVICE	205	E	Private household worker--such as a servant, butler, etc.
		F	Protective worker--such as a policeman, detective, sheriff, fireman.
		G	Service worker--such as a barber, beautician, waiter, etc.

Acronym	Item Number	Response Letter	Response That It Represents
	207	E	Private household worker--such as housekeeper, maid, laundress, etc.
		F	Protective worker--such as a policewoman.
		G	Service worker--such as beautician, waitress, etc.
SKILLED	205	H	Semi-skilled worker--such as a barber, beautician, waiter, etc.
		I	Skilled worker or foreman--such as a baker, carpenter, electrician, enlisted man in the armed forces, mechanic, plumber, plasterer, tailor, foreman in a factory or mine, etc.
	207	H	Semi-skilled worker--such as a factory machine operator, cab driver, etc.
		O	Skilled worker or forewoman, such as a baker, inspector, etc.
CLRSAL	205	J	Clerical worker--such as a bank teller, bookkeeper, sales clerk, office clerk, mail carrier, messenger, etc.
		K	Salesman--such as a real estate or insurance salesman, factory representative.

Acronym	Item Number	Response Letter	Response That It Represents
	207	J	Clerical worker--such as a bookkeeper, secretary, typist, sales clerk, store clerk, etc.
		K	Sales--such as a real estate, life insurance salesman, etc.
MGROFF	205	M	Official--such as a manufacturer, officer in a large company, banker, government official or inspector, etc.
	207	M	Official--such as a manufacturer, officer in a large company, banker, government official or inspector.
PROTEC	205	O	Professional--such as an actor, accountant, artist, clergyman, dentist, engineer, lawyer, librarian, scientist, etc.
		P	Technical--such as a draftsman, surveyor, medical or dental technician, etc.
	207	O	Professional--such as an actress, accountant, artist, dentist, physician, engineer, lawyer, librarian, scientist, etc.
		P	Technical--such as a draftsman, medical or dental technician, etc.
LGCOM	209	A	A large company or industry.
	210	A	A large company or industry.

Acronym	Item Number	Response Letter	Response That It Represents
SMCOM	209	B	A small local company or industry.
		C	A retail business.
		D	An individual employer.
	210	B	A small local company or industry.
		C	A retail business.
		D	An individual employer.
SELFEM	209	E	He is self-employed.
	210	H	She is self-employed.
GOOT	209	F	The local or community government.
		G	A school or college.
		H	Military services.
		I	The state or national government.
	210	E	The local or community government.
		F	A school or college.
		G	The state or national government.
GENERAL	090	A	General—a program that does not necessarily prepare you either for college or for work, but in which you take subjects required for graduation and many subjects that you like.
COLPREP	090	B	College preparatory—a program that gives you the training and credits needed to work toward a regular bachelor's degree in college.
BUSNS	090	C	Business—a program that prepares you to work in an office; for example, as a secretary or accountant.

Acronym	Item Number	Response Letter	Response That It Represents
VOC	090	D	Vocational—a program that prepares you to work in a shop or factory, or to enter a trade school, or become an apprentice after high school.
OTHER	090	E	Agriculture.
		F	A program very different from the above.
MAPA	216	A	Mother and father.
BROKEN	216	B	Mother only.
		C	Father only.
		D	Sometimes with my mother, sometimes with my father.
		E	Mother and stepfather.
		F	Father and stepmother.
RELAT	216	G	Grandparents, aunt, uncle, or cousins.
		H	Brother or sister.
HERE	220	A	I have lived here all my life.
NOTRG	283	C	No driver training, even though course is available
BUSPRO	174	B	Business profits
		C	Fixed salary
		D	Wages
		E	Commissions or royalties
		F	Some other source, not mentioned above

APPENDIX D

Table 1

The Significant Correlations (p < .01) Between the Various SIB Item Scores and the MIQ Scale Scores of Eighth Grade Females

MIQ Scale	SIB Item Number	Decriptive Statement	N	r
Ability Utilization	PROTEC		156	0.2711
	248	Normal use of both hands	163	-0.2471
	080	Gets behind in school work	190	0.2426
	079	Can't pay attention	188	0.2212
	021	Metal working	190	0.2184
	075	Missed assignment by not paying attention	189	0.2085
	043	Sales work	189	0.1961
	BUSNS		187	-0.1912
Achievement	043	Sales work	185	0.2387
	042	Retail store work, stock work, delivery, etc	184	0.2195
Activity	232	Treatment by doctor in last six months	148	0.2427
	221	Number of rooms in home	150	-0.2419
	159	Parental facility in Italian	159	0.2218
	031	Playing hockey, lacrosse, hand ball, boxing,etc.	173	-0.2141
	176	Women's magazines in home	159	-0.2108
	086	Can't concentrate on reading	174	-0.2081
	088	Has trouble remembering what is read	173	-0.2035
Advancement	177	Men's magazines in home	165	0.2003
Compensation	043	Sales work	177	0.2401
	234	Bedtime on weekends	153	-0.2094
Co-workers	249	Trouble with back or spine	161	-.2252
Creativity	PROTEC		151	0.2824
	217	Number of children in home	158	-0.2265
	177	Men's magazines in home	166	0.2186
	267	Sleeps more than others	158	0.2107
	128	Discusses after-school plans with adult	177	0.2011
	001	School newspaper,magazine	183	0.1966

Table 1 (Continued)

MIQ Scale	SIB Item Number	Descriptive Statement	N	r
Independence	191	Number of decorative elements in home	155	-0.2081
	077	If dislike course, do only enough to get by	173	0.1989
Moral Values	142	Father active in hobby groups	167	0.2544
	017	Photography	182	0.2276
	020	Cabinet or work working	180	0.2149
	102	Number of vocational courses	160	-0.2076
	022	Mechanical or auto repair	180	0.1931
Recognition	241	Speaks clearly all the time	156	0.2227
	185	Science fiction magazines in home	165	-0.2207
	092	Last time changed schools	179	-0.2206
Responsibility	166	Length of residence in present community	175	-0.2576
	204	Number of brothers/sisters in 4-year colleges	143	-0.2576
	225	Age at which social dancing was learned	127	0.2350
	001	School newspaper, magazines	185	0.1928
	036	Time during school year worked for pay	186	0.1899
Security	013	Graphic arts	186	0.2529
	079	Can't pay attention	183	0.2090
	052	Evenings permitted to go out	186	0.2061
	074	Difficult assignments are a challenge	185	0.2051
	043	Sales work	184	0.1975
	026	Participation in sports	184	0.1954
Social Service	227	Memberships in clubs	161	0.2371
Social Status	176	Women's magazines in home	165	0.2429
	144	Father active in social groups	167	-0.2190
	173	Description of family finances	160	0.2094
	093	Age when started first grade	182	0.1925

Table 1 (Continued)

MIO Scale	SIB Item Number	Descriptive Statement	N	r
Supervision - Human Relations	170	Rent payment level	63	-0.3589
Supervision - Technical	281	Number of times a car is driven during a week	147	0.2117
	162	Parental facility in Hebrew or yiddish	168	0.2110
	136	Parents born in U.S.	170	0.2025
	157	Parental facility in French	168	0.2021
Working Conditions	261	Has severe headaches	158	0.2277
	267	Sleeps more than others	158	0.2046
TCT	MGROFF		157	0.2956
	BUSPRO		159	0.2636
	227	Membership in clubs	165	-0.2610
	185	Science fiction magazines in home	174	0.2504
	182	Business magazines in home	174	0.2492
	180	Farm magazines in home	173	0.2369
	080	Gets behind in assignments	191	-0.2329
	178	Movie, love, detective magazines in home	174	0.2183
	183	Opinion magazines in home	171	0.2160
	122	Discusses after-school plans with mother	183	-0.2149
	253	Had rheumatic fever	163	-0.2119
	179	Mechanics,electronics, aviation magazines in home	174	0.2084
	258	Had infantile paralysis	163	-0.2029
	121	Discusses after-school plans with father	185	-0.1917
	104	Amount of time spent on calculus	179	0.1915

Table 2

The Significant Correlations (p < .01) Between the Various SIB Item Scores and the MIQ Scale Scores of Eighth Grade Males

MIQ Scale	SIB Item Number	Descriptive Statement	N	r
Ability Utilization	110	Grades in vocational courses	75	-0.3165
	FIXSAL		118	0.2774
	166	Length of residence in present community	133	0.2721
	168	Number of different residences	126	-0.2686
	282	Have a car for own use	98	-0.2584
	164	Parental facility in Oriental language	132	0.2537
Achievement	215	Mother's educational level	75	0.3452
	063	Love stories read	141	-0.2454
	058	Science non-fiction books	141	-0.2433
	057	Science fiction books read	140	-0.2369
	164	Parental facility in Oriental language	129	0.2369
Advancement	215	Mother's educational level	76	0.4059
	110	Grades in vocational courses	73	-0.3287
	171	Present value of home	84	0.3184
	166	Length of residence in present community	129	0.2612
	129	Main means of family support	133	-0.2580
	PROFEE		115	0.2413
	189	Electrical appliances in home	118	0.2382
	164	Parental facility in Oriental language	128	0.2356
	175	Number of books in the home	123	0.2303
	063	Love stories read	138	-0.2293
	067	Grades accurately reflect abilities	136	-0.2257
	087	Keeps up-to-date on assignments	137	-0.2237
Authority	141	Father active in business or professional associations	127	0.2850
	100	Number of English courses	102	0.2824
	099	Length of residence in present community	103	0.2605
	148	Mother active in school organizations	125	-0.2350
	115	Discusses high school work with teachers & principals	135	0.2207

Table 2 (Continued)

MIQ Scale	SIB Item Number	Descriptive Statement	N	r
Company Policies and Practices	257	Has heart trouble	94	0.2657
	100	Number of English courses	102	0.2643
	166	Length of residence in present community	127	0.2638
	189	Electrical appliances in home	114	0.2606
	038	Clerical work	138	0.2243
Compensation	100	Number of English courses	108	0.2733
	255	Has hay fever	97	0.2796
	226	Membership in athletic groups	102	0.2754
	221	Number of rooms in home	101	0.2740
Co-workers	100	Number of English courses	105	0.2955
	078	Difficulty with mechanics of English composition	139	-0.2757
	099	Number of social studies courses	106	0.2622
	187	Reader's Digest, Coronet in home	118	0.2390
Creativity	215	Mother's educational level	75	0.3820
	110	Grades in vocational courses	73	-0.3351
	109	Grades in English courses	97	-0.3237
	171	Present value of home	85	0.3025
	259	Has frequent sore throats	97	0.2856
	175	Number of books in home	123	0.2840
	176	Women's magazines in home	120	0.2831
	108	Grades in history and social studies	97	-0.2739
	189	Electrical appliances in home	118	0.2680
	131	Father supervises other people	114	0.2555
	082	Slow reading holds me back	140	0.2401
	039	Farm or orchard work	142	0.2150
Independence	279	Number of athletic awards	84	-0.3195
	019	Making or repairing electrical equipment	136	-0.2907
	060	Books read on politics, world affairs, history	135	-0.2592
	VOC		134	0.2274

Table 2 (Continued)

MIQ Scale	SIB Item Number	Descriptive Statement	N	r
Moral Values	072	Failure to pay attention lowers grades	141	0.2609
	060	Books read on politics, world affairs, history	135	-0.2592
Recognition	215	Mother's educational level	74	0.3689
	110	Grades in vocational courses	73	-0.3819
	111	Grades in business courses	62	-0.3781
	042	Retail store work, stock work, delivery etc	140	0.2297
Responsibility	215	Mother's educational level	77	0.3985
	250	Has stomach trouble	96	0.3206
	260	Has severe aching joints	97	0.3032
	131	Father supervises other people	114	0.2939
	259	Has frequent sore throats	97	0.2807
	189	Electrical appliances in the home	118	0.2898
Security	HERE		100	0.3017
	270	Takes medicine or pills prescribed by doctor	95	0.2629
	226	Membership in athletic groups	101	0.2599
	168	Number of difference residences	123	-0.2582
	198	Year of newest car/wagon	105	0.2575
	048	Money from a job	141	0.2201
Social Service	237	Wears glasses	101	0.2818
	189	Membership in athletic groups	119	0.2410
	001	Electrical appliances in home	143	0.2187
Social Status	267	Sleeps more than others	95	-0.3619
	215	Mother's educational level	74	0.3066
	182	Business magazines in home	117	0.2893
	180	Farm magazines in home	117	0.2762
	176	Women's magazines in home	118	0.2519
	WAGE		113	-0.2411
	184	Professional or trade magazines in home	117	0.2491

Table 2 (Continued)

MIO Scale	SIB Item Number	Descriptive Statement	N	r
Supervision - Human Relations	PROFEE		108	-0.2862
	072	Failure to pay attention lowers grades	132	0.2514
	002	School subject matter clubs	133	0.2318
	073	Difficult assignment is a challenge	131	0.2274
Supervision - Technical	222	Number of people in home	97	0.3533
	226	Membership in athletic groups	98	0.2964
	069	Accomplishes very little compared to time spent	137	-0.2211
Variety	184	Professional or trade magazines in home	117	0.3079
	176	Women's magazines in home	118	0.2454
	058	Science non-fiction books	138	-0.2430
	146	Father active in military reserve or veterans	129	-0.2390
Working Conditions	092	Last time changed schools	145	-0.2378
TCT	FARM		108	0.2970
	227	Membership in clubs	99	0.2611
	119	Discusses high school work with school counselor	142	0.2765
	218	Number of older brothers	96	0.2611
	069	Accomplishes very little compared to time spent	144	-0.2395
	042	Retail store work, stock work, delivery, etc	145	-0.2393
	051	Number of dates per week	142	0.2283
	141	Father active in business or professional associations	133	-0.2264

Table 3

The Significant Correlations (p < .01) Between the Various SIB Item Scores and the MIQ Scale Scores of Ninth Grade Females

MIQ Scale	SIB Item Number	Descriptive Statement	N	r
Activity	003	Public speaking/performance clubs	134	0.2338
Advancement	256	Has allergies	75	0.3068
Authority	254	Has asthma	69	0.3304
	LABOR		80	0.3111
Company Policies and Practices	053	Number of times "gone steady"	128	-0.2363
	051	Number of dates per week	126	-0.2341
Compensation	062	Number of comic books read	121	0.2371
Co-Workers	029	Attending fine arts events	142	0.2354
	012	Captaincy of athletic teams	144	-0.2221
	031	Playing hockey, lacrosse, boxing, etc.	142	0.2155
Creativity	255	Has hay fever	69	0.3224
	095	Days absent from school	112	0.2668
	018	Making jewelry, pottery,etc.	140	-0.2449
Independence	260	Has severely aching joints	70	-0.3202
Moral Values	228	Times sick in bed	77	-0.3302
	CLRSAL		80	-0.3008
	088	Trouble remembering what is read	114	0.2739
Recognition	039	Farm or orchard work	141	0.2694
	015	Collecting stamps, coins,etc.	147	0.2338
	068	Makes sure of school assignment before beginning	126	-0.2312
Responsibility	204	Number of brother/sisters going to a 4-year college	92	0.3269
	217	Number of children in family	86	-0.3071
	099	Number of social studies courses	115	0.2653
	103	Number of math courses	114	0.2454

Table 3 (Continued)

MIO Scale	SIB Item Number	Descriptive Statement	N	r
Security	136	Parents born in U.S.	112	-0.2706
Social Service	CLRSAL		82	0.2911
	018	Making jewelry, pottery,etc.	146	-0.2637
	082	Slow reading holds me back	121	-0.2433
	023	Raising animals or pets	147	-0.2277
Social Status	275	Number of art awards	68	0.3961
	278	Student government, Boy Scouts, Girl Scouts, etc.	67	0.3532
	096	Number of hours studying	110	-0.3034
	015	Collecting stamps, coins,etc.	142	0.2990
	068	Makes sure of assignments before beginning	121	-0.2371
	010	Presidency of class, club	141	0.2196
Supervision - Human Relations	255	Has hay fever	71	0.3604
	241	Speaks clearly all the time	73	-0.3467
	267	Sleeps more than others	72	0.3200
	029	Attends fine arts events	144	-0.2587
	028	Hunting and fishing	145	-0.2416
	017	Photography	144	-0.2302
Variety	OTSOUR		89	0.2771
	COLPREP		113	-0.2738
	199	Respondent is a twin, triplet	95	0.2710
	054	Evenings a week out for fun	129	0.2315
Working Conditions	GOVT		68	-0.3712
	032	Going bicycling, ice skating, skiing, canoeing, etc.	145	0.2681
	029	Attending fine arts events	146	0.2633
	031	Playing hockey, lacrosse, boxing, etc.	146	0.2519
	011	Officer or committee chairman of class or club	148	-0.2183
TCT	NOTRG		70	0.3255
	260	Has severely aching joints	75	0.3089
	240	Wears a hearing aid	78	0.2954
	105	Grades in mathematics	113	0.2541

Table 4

The Significant Correlations (p < .01) Between the Various SIB Item Scores and the MIQ Scale Scores of Ninth Grade Males

MIQ Scale	SIB Item Number	Descriptive Statement	N	r
Ability Utilization	012	Captaincy of athletic teams	148	0.2672
Achievement	263	Has aches and pains but does not see doctor	80	-0.3440
	MGROFF		85	0.2844
	116	Discusses personal problems with teacher or principal	123	0.2765
	099	Number of social studies courses	123	-0.2415
	GENERAL		122	-0.2379
	052	Evenings permitted to go out	143	-0.2368
	056	Western, adventure, or mystery stories read	136	0.2342
Activity	198	Year of newest car/wagon	88	0.2960
	108	Grades in history and social studies	91	0.2815
Advancement	WAGE		104	-0.2511
	137	Father active in church work	112	-0.2489
Authority	215	Mother's educational level	66	-0.4274
	217	Number of children in family	81	0.2936
	012	Captaincy of athletic teams	139	0.2885
	003	Public speaking/performance clubs	139	0.2550
	015	Collecting stamps, coins,etc.	138	0.2300
Company Policies and Practices	FIXSAL		101	0.3379
	WAGE		101	-0.2998
	242	Speech easily understood	81	-0.2848
	071	Enjoys writing reports, etc.	123	0.2793
Co-Workers	263	Has aches and pains but does not see doctor	72	-0.3457
	144	Father active in social groups	105	0.3082
	260	Has severely aching joints	73	-0.3057
	021	Metal working	139	0.2646
	OTSOUR		98	0.2612

Table 4 (Continued)

MIO Scale	SIB Item Number	Descriptive Statement	N	r
Creativity	222	Number of people in home	78	-0.3324
	200	Number of brothers/sisters leaving school	87	-0.3300
Independence	165	Parental facility in some other foreign language	108	0.2675
	106	Grades in science	105	0.2550
	035	Number of summers worked for pay	139	0.2236
Moral Values	067	Grades accurately reflect abilities	120	-0.2698
	059	Number of plays, poetry, essays and classics read	126	0.2680
	034	Age at which first money earned	138	-0.2620
	105	Grades in mathematics	111	-0.2548
	036	Time during school year worked for pay	139	0.2488
	149	Mother active in political groups	107	-0.2488
	035	Number of summers worked for pay	138	0.2468
	048	Money from a job	132	0.2299
	037	Delivering newspapers, baby-sitting, mowing lawns, etc.	138	-0.2235
Recognition	OTSOUR		101	0.3547
	160	Parental facility in Portuguese	110	-0.2674
Responsibility	075	Missed assignments by not paying attention	129	0.2632
Security	116	Discusses personal problems with teachers or principal	122	-0.2367
Social Service	263	Has aches and pains but does not see doctor	77	-0.3194
	WAGE		100	-0.2976
	011	Officer or committee chairman of class or club	141	0.2514
	001	School newspaper, magazine	140	-0.2215

Table 4 (Continued)

MIO Scale	SIB Item Number	Descriptive Statement	N	r
Social Status	160	Parental facility in Spanish	104	-0.3316
	WAGE		98	-0.2759
	193	Sports equipment in home	90	-0.2737
	077	If dislike course, do just enough to get by	119	-0.2477
	012	Captaincy of athletic teams	137	0.2369
	047	Money from family if needed	131	0.2335
Supervision - Human Relations	242	Speech easily understood	81	-0.3310
	241	Speaks clearly all the time	81	-0.2973
	186	Atlantic Monthly, Fortune, New Yorker in the home	107	-0.2642
	029	Attends fine arts events	147	-0.2234
Supervision - Technical	WAGE		98	-0.2759
Variety	215	Mother's educational level	65	-0.3310
	172	Family's total income	52	-0.3867
	014	Performing arts	136	0.2544
Working Conditions	175	Number of books in the home	107	-0.3155
	106	Grades in science	111	0.2831
	058	Science non-fiction read	133	-0.2350
TCT	204	Number of brothers/sisters in a 4-year college	87	-0.3629
	130	Number of jobs held by father	115	0.2664
	073	Difficult assignment is a challenge	130	0.2388

Table 5

The Significant Correlations (p < .01) Between the Various SIB Item Scores and the MIQ Scale Scores of Tenth Grade Females

MIQ Scale	SIB Item Number	Descriptive Statement	N	r
Ability Utilization	277	Number of athletic awards	225	0.2239
	FARM		229	-0.2030
	BUSNS		265	-0.2000
	OTHER		265	0.1829
	238	Has trouble hearing	226	-0.1754
	054	Evenings a week out for fun	263	-0.1751
	SERVICE		229	0.1708
Achievement	214	Father's educational level	195	0.2586
	250	Has stomach trouble	223	0.2171
	BUSNS		262	-0.2143
	227	Membership in clubs	224	0.2085
	215	Mother's educational level	200	0.1892
	065	Has trouble expressing self in writing	262	-0.1779
	236	Has trouble seeing	222	0.1738
	OTHER		262	0.1585
Activity	065	Has trouble expressing self in writing	242	-0.2761
	081	Grades lowered because of careless errors	242	-0.2620
	066	Is a fast reader	242	0.2294
	069	Accomplishes very little compared to time spent	242	-0.2248
	078	Difficulty with mechanics of English composition	242	-0.2229
	221	Number of rooms in home	208	-0.2216
	082	Slow reading holds me back	240	-0.2189
	061	Books read on religion	242	-0.2187
	042	Retail store work, Stock work, delivery, etc.	242	-0.2184
	227	Membership in clubs	224	0.2085
	BUSPRO		220	0.2073
	105	Grades in mathematics	241	0.2061
	035	Number of summers worked for pay	242	0.1994
	043	Sales work	242	-0.1991
	092	Last time changed schools	241	0.1986
	002	School subject matter clubs	242	-0.1841
	044	Camp counselor	242	-0.1829
	045	Other work for pay	242	-0.1721
	055	Number of books read	242	-0.1688
	039	Farm or orchard work	242	-0.1678

Table 5 (Continued)

MIO Scale	SIB Item Number	Descriptive Statement	N	r
Advancement	LABOR		227	-0.2828
	BUSPRO		238	0.2325
	SERVICE		217	-0.2099
	107	Grades in foreign language	162	-0.2054
	217	Number of children in family	226	-0.2053
	102	Number of vocational courses	261	-0.2037
	231	Health at 10 years	225	0.1879
	224	Respondent's weight	225	-0.1828
	251	Wears a brace, special shoes	224	-0.1755
	001	School newspaper, magazines	262	-0.1604
Authority	224	Respondent's weight	209	-0.1972
	236	Has trouble seeing	207	-0.1791
	067	Grades accurately reflect abilities	244	-0.1736
	076	Teachers criticize for not paying attention	246	0.1697
Company Policies and Practices	066	Is a fast reader	257	-0.2104
	229	Largest period of illness	214	0.1772
	276	Number of music awards	220	-0.1748
	269	Takes special exercises	221	0.1734
	085	Can pick out important point when studying	256	-0.1724
Compensation	071	Enjoys writing reports	253	0.2315
	257	Has heart trouble	220	0.1728
Co-Workers	099	Number of social studies courses	247	-0.2333
	071	Enjoys writing reports	244	0.2289
	LABOR		214	-0.2042
	222	Number of people in home	213	0.2007
	046	Receives regular allowance	245	-0.1844
Creativity	MGROFF		214	0.2554
	278	Student government, Boy Scouts, Girl Scouts, etc.	220	0.2170
	FARM		224	-0.1852
	015	Collecting stamps, coins,etc.	256	0.1775
	276	Number of music awards	220	0.1748
	003	Public speaking/performance clubs	256	-0.1622
	092	Last time changed schools	255	0.1603

Table 5 (Continued)

MIO Scale	SIB Item Number	Descriptive Statement	N	r
Independence	SMCOM		183	0.3597
	GOVT		183	-0.2762
	PROTEC		198	-0.2191
	SERVICE		209	0.2085
	271	Number of science awards	204	0.2024
	WAGE		220	0.1949
	074	Difficult assignments are a challenge	242	0.1913
	278	Student government, Boy Scouts, Girl Scouts, etc.	204	0.1893
	FARM		209	-0.1831
	235	Wears glasses	205	0.1815
Moral Values	227	Membership in clubs	220	0.2809
	BUSNS		257	-0.2247
	046	Receives regular allowance	255	-0.2245
	238	Has trouble hearing	219	-0.2021
	215	Mother's educational level	196	0.2001
	COLPREP		257	0.1981
	104	Amount of time spent on calculus	254	0.1910
	218	Number of older brothers	219	0.1863
	044	Camp counselor	257	-0.1748
	054	Evenings a week out for fun	255	-0.1747
	014	Performing arts	257	-0.1735
	105	Grades in mathematics	257	-0.1676
	049	Money from other sources	257	-0.1621
Recognition	234	Bedtime on weekends	206	0.2479
	279	Age when respondent learned to drive	157	0.2207
	MGROFF		201	0.1959
	FARM		201	-0.1934
Responsibility	278	Student government, Boy Scouts, Girl Scouts, etc.	219	0.2514
	235	Wears glasses	220	0.1970
	227	Membership in clubs	221	0.1881
	MGROFF		213	0.1757
	074	Difficult assignments are a challenge	258	0.1670
	052	Evenings permitted to go out	256	-0.1654
	024	Sewing, knitting, crocheting	257	0.1621

Table 5 (Continued)

MIQ Scale	SIB Item Number	Descriptive Statement	N	r
Security	026	Participation in sports	263	-0.2283
	104	Amount of time spent on calculus	260	0.2106
	044	Camp counselor	263	-0.1989
	039	Farm or orchard work	263	-0.1906
	218	Number of older brothers	224	0.1888
	032	Going bicycling, ice skating, skiing, canoeing, etc.	260	-0.1822
	035	Number of summers worked for pay	263	0.1796
	101	Number of business courses	262	0.1769
	045	Other work for pay	263	-0.1760
	247	Normal use of both arms	224	0.1736
	042	Retail store work, stock work, delivery, etc.	263	-0.1700
Social Service	003	Public speaking/performance clubs	262	-0.2347
	218	Number of older brothers	224	0.2270
	063	Love stories read	262	0.2144
	199	Respondent is a twin, triplet	236	-0.2066
	014	Performing arts	262	-0.2054
	217	Number of children in family	226	0.1800
	241	Speaks clearly all the time	224	0.1712
Social Status	SERVICE		222	0.2317
	271	Number of science awards	210	0.2249
	023	Raising animals or pets	250	0.2132
	234	Bedtime on weekends	211	0.2091
	035	Number of summers worked for pay	250	0.2062
	SKILLD		205	0.2000
	FARM		205	-0.1978
	104	Amount of time spent on calculus	247	-0.1892
	253	Had rheumatic fever	218	-0.1775
	086	Can't concentrate on reading	250	-0.1745
	089	Must read materials over and over	250	-0.1697
Supervision - Human Relations	269	Takes special exercises	212	0.2323
	276	Number of music awards	211	-0.2205
	266	Follows a special diet	212	0.2123
	167	Previous type of community	237	-0.1786

Table 5 (Continued)

MIQ Scale	SIB Item Number	Descriptive Statement	N	r
Supervision - Technical	SERVICE		222	0.2317
	276	Number of music awards	218	-0.1950
	059	Number of plays, poetry, essays, classics read	256	-0.1826
	057	Science fiction books read	255	-0.1810
	253	Had rheumatic fever	218	-0.1775
	012	Captaincy of athletic teams	254	-0.1768
	050	Age of first date	255	0.1744
	167	Previous type of community	245	-0.1672
	024	Sewing, knitting, crocheting	255	0.1622
Variety	BUSPRO		229	0.2282
	LABOR		217	-0.2066
	271	Number of science awards	213	0.2002
	221	Number of rooms in home	215	0.2002
	227	Membership in clubs	215	0.1912
	212	Mother's age	206	-0.1860
	SERVICE		209	-0.1830
Working Conditions	071	Enjoy's writing reports	261	0.2143
TCT	SMCOM		203	0.2652
	271	Number of science awards	225	0.2259
	215	Mother's educational level	203	-0.2235
	214	Father's educational level	198	-0.2192
	GOVT		203	-0.2139
	212	Mother's age	218	-0.2059
	031	Playing hockey, lacrosse, boxing, etc.	265	0.2000
	221	Number of rooms in home	227	-0.1915
	011	Officer or committee chairman of class or club	264	-0.1866
	261	Has severe headaches	226	-0.1865
	275	Number of art awards	226	0.1854
	274	Number of writing, debate or oratory awards	226	0.1840
	028	Hunting and fishing	265	0.1807
	100	Number of English courses	263	-0.1782
	063	Love stories read	265	-0.1704
	218	Number of older brothers	226	-0.1738
	001	School newspaper, magazines	265	-0.1673
	129	Main means of family support	261	0.1630

Table 6

The Significant Correlations (p < .01) Between the Various SIB Item Scores and the MIQ Scale Scores of Tenth Grade Males

MIQ Scale	SIB Item Number	Descriptive Statement	N	r
Ability Utilization	246	Normal use of both legs	196	0.2419
	002	School subject matter clubs	227	0.2365
	247	Normal use of both arms	196	0.2217
	107	Grades in foreign language	146	0.2186
	003	Public speaking/performance clubs	229	0.2113
	098	Number of foreign language courses	227	-0.1893
	001	School newspaper, magazines	229	0.1795
Achievement	GENERAL		221	-0.2568
	247	Normal use of both arms	191	0.2342
	003	Public speaking/performance clubs	223	0.2281
	LGCOM		171	-0.2167
	246	Normal use of both legs	191	0.1996
Activity	098	Number of foreign language courses	217	-0.2668
	039	Farm or orchard work	219	-0.2473
	078	Difficulty with mechanics of English composition	219	-0.2394
	107	Grades in foreign languages	141	0.2346
	204	Number of brothers/sisters in a 4-year college	173	-0.2301
	215	Mother's educational level	173	-0.2279
	VOC		217	0.2241
	035	Wears glasses	219	0.2224
	106	Grades in science	217	0.2158
	022	Mechanical or auto repair	219	-0.2135
	259	Has frequent sore throats	186	-0.2067
	COLPREP		217	-0.2019
	033	Time doing chores around the house	219	0.2007
	066	Is a fast reader	219	0.1982
	222	Number of people in home	185	0.1981
	069	Accomplishes very little compared to time spent	219	-0.1961
	102	Number of vocational courses	219	0.1896
	020	Cabinet or workworking	219	-0.1878
	004	Hobby clubs	219	-0.1849
	028	Hunting and fishing	219	-0.1830
	060	Books read on politics, world affairs, history	218	-0.1829

Table 6 (Continued)

MIQ Scale	SIB Item Number	Descriptive Statement	N	r
Advancement	003	Public speaking/performance clubs	229	0.2293
	268	Avoids physical exertion	194	0.2261
	SMCOM		181	-0.2029
Authority	007	Informal neighborhood groups	207	-0.2413
	027	Gardening, flowers, etc.	207	0.2209
	100	Number of English courses	206	-0.2076
	055	Number of books read	205	-0.2054
	262	Has spells of dizziness	177	0.1991
Company Policies and Practices	241	Speaks clearly all the time	193	0.2726
	232	Number of visits to doctor	183	-0.2449
	242	Speech easily understood	191	0.2345
	224	Respondent's weight	192	0.2304
	260	Has severely aching joints	193	0.2232
	095	Number of days absent from school	226	0.2021
	129	Main means of family support	221	0.1905
	059	Number of plays, poetry, essays and classics read	226	-0.1735
Compensation	254	Has asthma	193	0.1955
	029	Attends fine arts events	225	0.1774
	056	Western, adventure, and mystery stories read.	221	-0.1730
Co-Workers	241	Speaks clearly all the time	185	0.2940
	003	Public speaking/performing clubs	217	0.2410
	217	Number of children in family	185	0.2389
	059	Number of plays, poetry, essays and classics read	217	-0.1977
	039	Farm or orchard work	217	-0.1976
Creativity	247	Normal use of both arms	191	0.2563
	107	Grades in foreign language	144	0.2468
	217	Number of children in family	191	-0.2075
	087	Keeps up-to-date on assignments	223	0.2002
	075	Missed assignments by not paying attention	222	-0.1956
	062	Comic books read	223	-0.1809
	080	Gets behind in assignments	223	-0.1754
	099	Number of social studies courses	223	0.1754

Table 6 (Continued)

MIQ Scale	SIB Item Number	Descriptive Statement	N	r
Independence	091	Number of times changed school	92	0.2797
	279	Age when respondent learned to drive	149	-0.2599
	199	Respondent is a twin, triplet	178	0.2534
	270	Takes medicine prescribed by doctor	174	-0.2416
	259	Has frequent sore throats	175	0.2368
	242	Speech easily understood	173	0.2367
	038	Clerical work	202	-0.2182
	044	Camp counselor	202	-0.2135
	009	Social clubs	201	-0.2124
	037	Delivering newspapers, baby-sitting, mowing lawns, etc.	202	0.2074
	238	Has trouble hearing	175	-0.2057
	076	Teachers criticize for not paying attention	202	-0.1993
	030	Playing golf, tennis, etc.	201	0.1988
Moral Values	MGROFF		181	-0.2172
	GENERAL		213	-0.2061
	072	Failure to pay attention lowers grades	215	0.2042
	073	Difficult assignment is a challenge	213	-0.2000
	233	Average number of hours of sleep a night	181	0.1934
	069	Accomplishes very little compared to time spent	215	0.1871
	080	Gets behind in assignments	215	0.1864
	039	Farm or orchard work	215	-0.1863
	079	Can't keep mind on what teacher is saying	213	0.1803
	064	Does little more than course requires	215	-0.1789
	065	Trouble expressing self in writing	215	0.1743
Recognition	MGROFF		189	-0.2614
	FIXSAL		197	-0.2600
	003	Public speaking/performance clubs	222	0.2585
	OTSOUR		197	0.2561
	081	Grades lowered because of careless errors	222	-0.1993
	237	Wears glasses	190	0.1962
	056	Western, adventure, and mystery stories read	218	-0.1922
	055	Number of books read	220	-0.1785

Table 6 (Continued)

MIQ Scale	SIB Item Number	Descriptive Statement	N	r
Responsibility	247	Normal use of both legs	195	0.2683
	281	Number of times a car is driven during week	193	0.2194
	248	Normal use of both hands	194	0.2097
	246	Normal use of both legs	195	0.2005
	PROTEC		196	0.1886
	FIXSAL		202	-0.1819
	002	School subject matter clubs	226	0.1813
	062	Number of comic books read	228	-0.1810
Security	055	Number of books read	227	-0.2425
	003	Public speaking/performance clubs	229	0.2236
	092	Last time changed schools	229	-0.2186
	056	Western, adventure, or mystery stories read	225	-0.2111
	059	Number of plays, poetry, essays and classics read	229	-0.2041
	LABOR		197	0.1871
	BROKEN		195	-0.1857
Social Service	105	Grades in mathematics	223	0.2661
	233	Average number of hours of sleep a night	196	0.2166
	030	Playing golf, tennis, etc.	227	-0.1958
	276	Number of music awards	196	0.1922
	203	Number of brothers/sisters at community college	186	-0.1909
	087	Keeps up-to-date on assignments	228	-0.1860
	241	Speaks clearly all the time	197	0.1829
	022	Mechanical or auto repair	228	-0.1754
	073	Difficult assignment is a challenge	226	-0.1748
Social Status	SELFEM		169	-0.2404
	230	Description of usual health	190	0.2302
	FIXSAL		197	-0.2184
	055	Number of books read	221	-0.2009
	MGROFF		190	-0.1990
	007	Informal neighborhood groups	223	-0.1984
	003	Public speaking/performance clubs	223	0.1890

Table 5 (Continued)

MIQ Scale	SIB Item Number	Descriptive Statement	N	r
Supervision - Human Relations	003	Public speaking/performance clubs	214	0.2712
	036	Time during school year worked for pay	214	0.2257
	028	Hunting and fishing	214	-0.2058
	095	Number of days absent from school	214	0.1997
	045	Other work for pay	214	-0.1836
Supervision - Technical	078	Difficulty with mechanics of English composition	213	-0.2072
	028	Hunting and fishing	213	-0.1935
	105	Grades in mathematics	208	0.1897
	045	Other work for pay	212	-0.1896
	036	Time during school year worked for pay	211	0.1815
Variety	107	Grades in foreign language	133	0.3369
	SERVICE		176	0.2616
	059	Number of plays, poetry, essays and classics read	207	-0.2385
	WAGE		182	-0.2274
	106	Grades in science	205	0.1936
	098	Number of foreign language courses	205	-0.1808
	062	Number of comic books read	207	-0.1779
Working Conditions	241	Speaks clearly all the time	193	0.2119
	089	Must read materials over and over	226	-0.2034
	106	Grades in science	224	0.1985
	105	Grades in mathematics	221	0.1906
TCT	078	Difficulty with mechanics of English composition	231	-0.2545
	229	Longest period of illness	188	0.2492
	COLPREP		229	0.2374
	136	Parents born in U.S.	222	0.2086
	065	Trouble expressing self in writing	231	-0.2018
	202	Number of brothers/sisters in business school	187	0.1917
	102	Number of vocational courses	231	0.1906
	VOC		229	0.1900
	101	Number of business courses	229	-0.1746
	002	School subject matter clubs	229	-0.1721

Table 7

The Significant Correlations (p < .01) Between the Various SIB Item Scores and the MIQ Scale Scores of Eleventh Grade Females

MIQ Scale	SIB Item Number	Descriptive Statement	N	r
Ability Utilization	BUSPRO		321	-0.1682
	BROKEN		349	-0.1482
	078	Difficulty with mechanics of English composition	352	0.1394
	MAPA		349	0.1394
Achievement	LGCOM		284	-0.1585
	WAGE		321	-0.1466
	016	Building models	353	0.1411
	004	Hobby clubs	352	0.1377
Activity	223	Respondent's height	327	-0.1793
	279	Age when respondent learned to drive a car	226	0.1728
	217	Number of children in family	327	0.1571
	066	Is a fast reader	332	0.1530
	COLPREP		332	-0.1512
	043	Sales work	333	0.1471
	237	Wears glasses	326	0.1446
	106	Grades in science	329	0.1430
Advancement	047	Money from family if needed	345	0.1418
Authority	202	Number of brothers/sisters in business school	299	0.2000
	044	Camp counselor	328	-0.1726
Company Policies and Practices	004	Hobby clubs	341	0.1683
	267	Sleeps more than others	332	0.1648
	270	Takes medicine prescribed by doctor	331	0.1552
	SELFEM		276	-0.1540
	227	Membership in clubs	337	0.1514
	266	Follows a special diet	330	0.1489
	CLRSAL		320	-0.1440
	237	Wears glasses	335	0.1408
Compensation	SKILLD		314	-0.1944
Co-Workers	030	Plays golf, tennis, etc.	340	-0.1674
	254	Has asthma	331	0.1662
	FARM		324	0.1442
	039	Farm or orchard work	339	0.1434

Table 7 (Continued)

MIQ Scale	SIB Item Number	Descriptive Statement	N	r
Creativity	003	Public speaking/performance clubs	329	-0.2202
	COLPREP		331	0.1840
	029	Attends fine arts events	331	-0.1792
	013	Graphic arts	330	-0.1687
	135	Father's highest rank in military service	319	-0.1672
	071	Enjoy's writing reports	329	-0.1550
	GENERAL		331	-0.1507
	247	Normal use of both arms	324	0.1445
	212	Mother's age	317	0.1439
Independence	200	Number of brothers/sisters leaving school	304	0.2305
	098	Number of foreign language courses	323	-0.1888
	103	Number of math courses	324	-0.1862
	255	Has hay fever	315	-0.1767
	270	Takes medicine prescribed by doctor	313	-0.1767
	011	Officer or committee chairman of class or club	323	-0.1658
	097	Number of science courses	323	-0.1628
	089	Must read materials over and over	323	-0.1611
	070	Lack of interest makes attention difficult	323	-0.1541
	COLPREP		323	-0.1540
Moral Values	006	Church groups	342	-0.2122
	050	Age of first date	336	0.1904
	227	Membership in clubs	338	0.1673
	276	Number of music awards	330	0.1668
	073	Difficult assignment is a challenge	342	-0.1576
	253	Had rheumatic fever	332	-0.1506
	101	Number of business courses	342	-0.1480
	135	Father's highest rank in military service	329	-0.1438
	080	Gets behind in assignments	341	-0.1414
	004	Hobby clubs	341	0.1387
Recognition	215	Mother's educational level	295	-0.1804
	PROTEC		323	-0.1512
	244	More trouble with facial skin than others	334	-0.1447

Table 7 (Continued)

MIO Scale	SIB Item Number	Descriptive Statement	N	r
Responsibility	214	Father's educational level	262	0.2002
	GENERAL		337	-0.1670
	046	Receives regular allowance	336	0.1635
	003	Public speaking/performance clubs	336	-0.1624
	103	Number of math courses	338	0.1446
	029	Attends fine arts events	338	-0.1403
Security	097	Number of science courses	345	-0.1891
	SMCOM		277	0.1798
	200	Number of brothers/sisters leaving school	326	0.1772
	103	Number of math courses	346	-0.1643
	COLPREP		345	-0.1625
	028	Hunting and fishing	346	0.1611
	RELAT		342	0.1518
	100	Number of English courses	346	-0.1481
	217	Number of children in family	340	0.1476
	270	Takes medicine prescribed by doctor	335	-0.1467
	007	Informal neighborhood groups	346	0.1445
	098	Number of foreign language courses	344	-0.1419
	BUSNS		345	0.1419
Social Service	129	Main means of family support	336	-0.1563
	COLPREP		348	0.1378
Social Status	215	Mother's educational level	287	-0.2375
	HERE		323	0.2329
	FARM		311	0.2284
	227	Membership in clubs	325	-0.1578
	PROTEC		311	-0.1557
Supervision - Human Relations	034	Age at which first money is earned	343	-0.1907
	045	Other work for pay	343	-0.1708
	059	Number of plays, poetry, essays and classics read	343	-0.1662
	267	Sleeps more than others	333	0.1646
	042	Retail store work, stock work, delivery, etc.	343	-0.1529
Supervision - Technical	060	Books read on politics, world affairs, history	341	-0.1861
	BUSPRO		309	-0.1544
	013	Graphic arts	340	0.1407

Table 7 (Continued)

MIO Scale	SIB Item Number	Descriptive Statement	N	r
Working Conditions	103	Number of math courses	351	-0.2321
	097	Number of science courses	350	-0.2062
	BUSPRO		319	-0.1892
	CLRSAL		328	-0.1892
	BUSNS		350	0.1838
	029	Attends fine arts events	351	0.1741
	RELAT		347	0.1691
	SMCOM		282	0.1676
	050	Age of first date	345	0.1618
	078	Difficulty with mechanics of English composition	350	-0.1588
	200	Number of brothers/sisters leaving school	330	0.1583
	046	Receives regular allowance	348	0.1561
	099	Number of social studies courses	351	-0.1505
	COLPREP		350	-0.1491
	218	Number of older brothers	335	0.1465
	FARM		332	0.1455
	199	Respondent is a twin, triplet	349	0.1386
TCT	233	Average number of hours of sleep a night	343	0.2507
	107	Grades in foreign languages	240	0.2446
	COLPREP		352	-0.2410
	106	Grades in science	348	0.1863
	FIXSAL		321	-0.1836
	011	Officer or committee chairman of class or club	352	-0.1780
	WAGE		321	0.1692
	214	Father's educational level	274	-0.1612
	BUSNS		352	0.1580
	073	Difficult assignment is a challenge	352	0.1451
	070	Lack of interest makes attention difficult	352	-0.1446
	098	Number of foreign language courses	351	-0.1445

Table 8

The Significant Correlations (p < .01) Between the Various SIB Item Scores and the MIQ Scale Scores of Eleventh Grade Males

MIQ Scale	SIB Item Number	Descriptive Statement	N	r
Ability Utilization	279	Age when respondent learned to drive	231	-0.1686
	053	Number of times "gone steady"	267	-0.1637
	095	Number of days absent from school	273	-0.1636
	056	Western, adventure, and mystery stories read	273	0.1571
Achievement	264	Catches colds often	264	0.1719
Activity	098	Number of foreign language courses	254	-0.3019
	103	Number of math courses	254	-0.2658
	039	Farm or orchard work	255	-0.2259
	235	Wears glasses	263	0.2117
	097	Number of science courses	252	-0.1932
	100	Number of English courses	254	-0.1906
	099	Number of social studies courses	254	-0.1738
	054	Evenings a week out for fun	250	-0.1676
	092	Last time changed schools	254	-0.1666
	COLPREP		254	-0.1653
	250	Has stomach trouble	247	-0.1647
Advancement	235	Wears glasses	263	0.2117
	FIXSAL		252	0.2094
	018	Making jewelry, pottery,etc.	270	0.1820
	011	Officer or committee chairman of class or club	270	-0.1714
Company Policies and Practices	244	Has more trouble with skin than others	254	0.1849
	032	Going bicycling, ice skating, skiing, canoeing, etc.	261	0.1718
	064	Does little more than course requires	261	0.1703
	233	Average number of hours of sleep a night	254	-0.1633
	023	Raising animals or pets	261	0.1585
Compensation	068	Makes sure of assignments before beginning	262	-0.1821
	227	Membership in clubs	255	-0.1719
	064	Does little more than course requires	262	0.1637

Table 8 (Continued)

MIQ Scale	SIB Item Number	Descriptive Statement	N	r
Co-Workers	LGCOM		225	-0.2124
	051	Number of dates per week	255	-0.1664
Creativity	057	Science fiction books read	263	0.1652
	014	Performing arts	264	-0.1594
	276	Number of music awards	255	0.1876
Independence	268	Avoids too much physical exertion	239	-0.2236
	069	Accomplishes very little compared to time spent	247	-0.2221
	107	Grades in foreign language	173	-0.2094
	103	Number of math courses	248	-0.1849
	BROKEN		241	0.1810
	054	Evenings a week out for fun	243	-0.1766
	250	Has stomach trouble	240	-0.1700
	VOC		247	0.1662
	COLPREP		247	-0.1652
	044	Camp counselor	248	-0.1638
Moral Values	035	Number of summers worked for pay	262	0.2075
	135	Father's highest rank in military service	256	0.2009
	039	Farm or orchard work	262	-0.1825
	053	Number of times "gone steady"	255	-0.1742
	006	Church groups	261	-0.1739
	241	Speaks clearly all the time	255	-0.1675
	231	Health at 10 years	254	-0.1670
Recognition	091	Number of times changed schools	125	0.2458
Responsibility	012	Captaincy of athletic teams	269	0.2178
	011	Officer or committee chairman of class or club	269	0.1666
Security	058	Science non-fiction read	270	-0.1817
	064	Does little more than course requires	270	0.1809
	057	Science fiction books read	269	-0.1790
	227	Membership in clubs	263	-0.1700
Supervision - Human Relations	214	Father's educational level	219	-0.2103
	064	Does little more than course requires	267	0.1694
	245	Been knocked unconscious	260	0.1587

Table 8 (Continued)

MIQ Scale	SIB Item Number	Descriptive Statement	N	r
Variety	239	Hard of hearing	253	0.1654
	038	Clerical work	259	-0.1629
Working Conditions	091	Number of times changed school	125	0.2583
	027	Gardening, flowers, etc.	271	0.1619
TCT	075	Missed assignments by not paying attention	274	-0.2689
	082	Slow reading holds me back	275	-0.2241
	080	Gets behind in assignments	275	-0.2067
	100	Number of English courses	274	-0.1923
	COLPREP		274	-0.1901
	251	Wears a brace, special shoes	268	-0.1869
	072	Failure to pay attention lowers grades	275	-0.1849
	088	Trouble remembering what is read	273	-0.1807
	060	Accomplishes very little compared to time spent	273	-0.1756
	021	Metal working	274	-0.1729
	199	Respondent is a twin, triplet	269	0.1682
	078	Difficulty with mechanics of English Composition	275	-0.1607
	097	Number of science courses	272	-0.1569